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A Survey of Population Changes in Belgium*

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INTRODUCTION

The presence of a small political unit with a large population in a position as a focus of routes in northwestern Europe draws attention to the problems involved in the geographic study of the whole European scene. The territory included within the political limits of Belgium (Fig. 1) amounts to 30,506 square kilometers[1] and the population numbered 8,299,940 on December 31, 1935.[2] The average density for the country as a whole reaches the figure of 272 per square kilometer. This places Belgium near the head of the list among occidental nations when total population is considered with reference to total national territory. The average is quite misleading, however, for actually the density varies from place to place within the boundaries depending largely upon the character of the occupance and upon the nature of the setting. In some instances, it drops below 25 per square kilometer while in others it rises above 5000 per square kilo-

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[1] *Annuaire statistique de la Belgique et du Congo Belge, 1936,* Ghent, 1936, Tome LVIII: xvii.

[2] "Relevé officiel du chiffre de la population du royaume à la date du 31 décembre 1935," *Moniteur Belge,* 26 May, 1936: 14.

FIG. 1.—Places mentioned in the text.

meter.[3] The patchwork of varying density gives a clue to the nature of any one part of the country at one particular time, but, as is true of a population distribution map for any one date, it presents but a single glimpse at a continually evolving whole. The nature of the present day landscapes of Belgium can best be approached by an examination of the course of change through which the population has passed. The factor of population lends itself handily to the dynamic approach for records of numbers and location of people have been accurately kept for some time. The present study confines itself to a survey of changes which have occurred in the ninety-year period from 1846 to 1935.[4]

The growth of population for the country as a whole has been continuous from 1846 to the present. The figure of 4,337,196 for the earlier date had nearly doubled by 1935 at the end of which the official figure was 8,-299,940. An increase in the rate of growth appears effective until the census of 1910 is reached.[5] During the next decade, the growth curve is unknown. There were no yearly estimates for the period 1914 to 1920. For a large part of that time, Belgium was occupied by armed forces and even in the southwestern section was the actual scene of the World War. The census of 1920 indicated a slightly larger figure than that of 1910, but the details of change can in no way be reconstructed with accuracy. Following the 1920 date, growth has continued though at a somewhat slower rate than previously.

Continued growth conforms with the general tendency throughout northwest Europe for the same period. It is part of the increase resulting from industrialization and commercialization. The population of Belgium in 1935 was 1.91 times that in 1846. The equivalent figures in nearby coun-

[3] An exhaustive treatment of population density in Belgium is to be found in Leyden, F., "Die Volksdichte in Belgien, Luxemburg, und den Niederlanden," *Petermanns Mitteilungen*, Ergänzungsheft Nr. 204, 1929.

[4] Censuses of the population of Belgium are available for the years 1846, 1856, 1866, 1880, 1890, 1900, 1910, 1920, and 1930. The recording or registering of the people by the civil authorities in each commune makes possible very accurate estimates at the end of each year. Every five years, between censuses, these figures are published. With the exception of the 1935 publication, the estimates have been used only as a check to changes indicated by the censuses. The 1935 figures have been used on a basis of equality with the censuses except where they show changes radically different from the 1930 trends.

Some census material for dates before 1846 is available, but its reliability is questioned. The best work on the earlier period is Quetelet, A., and Smits, E., *Recherches sur la reproduction et la mortalité de l'homme aux différens ages et sur la population de la Belgique*, Bruxelles, 1832.

[5] Jacquart, C., *Mouvement de la population et de l'état civil en Belgique pour les années 1901 à 1910*, Bruxelles, 1921: 140.

tries, for as near the same period as it is possible to secure statistics,[6] are as follows: Netherlands, 2.74; Denmark, 2.59; England and Wales, 2.36; Norway, 2.10; Germany, 1.90; Sweden, 1.87; and France, 1.18. From these indices, it may be concluded that Belgium has kept pace with Germany and has forged well ahead of France in the industrial scene of northwestern Europe. The median position in the list suggests the suitability of the unit as a reflection of population growth conditions for that portion of the continent.

During the nineteenth century, the increase in population may be accounted for largely by generally improved living conditions as evidenced by a declining death rate. The factor of immigration was more than counterbalanced by that of emigration. Since the turn of the century, the decline of the death rate has continued, but its effect on the total number has been significantly offset by a pronounced decline in the birth rate. Immigration has, however, grown to be a noticeable element contributing to the total increase. These three factors have combined to bring about a considerably reduced rate of growth of the total population in the last quarter century.[7]

POPULATION GROWTH CATEGORIES

While the country as a whole has grown, the change has not been uniform throughout the different parts. From the data available, it is possible to go into finer and finer detail down to the smallest political unit, the commune,[8] to discover what the nature of the growth has been. The method suggested by Dodge[9] was first employed. By means of this method, it is possible to recognize categories of population growth, distribute those categories on a map, and arrive at a delimitation of population regions. By treating with small areal units, greater detail can be obtained and an accurate picture of the real rather than the apparent changes may be built up. The political divisions of Belgium are such[10] as to allow a satisfactory examina-

[6] The population of each political unit for 1846 was taken from *Statistique internationale du mouvement de la population d'après les registres d'état civil. Résumé retrospectif.*, Paris, 1907. The population of each unit for the latest date (Norway and Denmark in 1930, France and England and Wales in 1931, Germany in 1933, and Netherlands and Sweden in 1934) was taken from *The Statesman's Year-Book 1936*, London, 1936. Due allowance was made for such territorial changes as had occurred during the time involved.

[7] *Cf. Annuaire statistique*, etc.: XVIII. See footnote 1.

[8] Though the communes form the basis of the detailed political organization of the country, they vary considerably in area. There are 2670 communes in the 30,506 square kilometers of Belgium, an average area of 11.4 square kilometers per commune. Some are as large as 70 square kilometers while others are less than 10 in area.

[9] Dodge, S. D., "A Study of Population Regions in New England on a New Basis," *Annals of the Association of American Geographers*, 25: 197–210.

[10] The Belgian nation is divided into nine provinces and each province is made up of several arrondisements. The arrondisements are in turn made up of communes.

tion by this method applied in different magnitudes.[11] For purposes of comparison, it should be stated that the Belgian provinces are somewhat larger than the counties of Michigan whereas the communes are somewhat smaller than the townships of the same state.

The growth characteristics of the provinces provide the first magnitude for study within the country. The provinces of Antwerp,[12] Brabant, and Limburg (Fig. 2) have shown continuous growth from 1846 to 1935. West-Vlaanderen and Oost-Vlaanderen show continued growth through 1910. The 1920 census indicates a decline on the part of both provinces, but, following this decline, there has been a resumption of increase so that the 1935 totals are higher than those of any previous year. These provinces are the ones which were most actively affected during the World War and the decline during the 1910–1920 decade may be taken as an indication of a purely temporary break. Hainaut, Luxembourg, and Namur show the 1910–1920 decline, but their resumption of growth has been less clearly marked. Hainaut reached a maximum in 1930 after a decline during the War decade. A notable drop during the five year period 1930–1935 gives indication that the stage of relative stability has been reached. A maximum for the province of Liége is also shown in the 1930 census. There is an apparent increase during the 1910–1920 decade for it must be recalled that the area ceded to Belgium by Germany at the end of the War is included in this province. The acquisition of territory brought an increase in numbers of people, 60,213 in 31 communes.[13] These same communes showed a population of 67,445 in 1935.[14] This is an increase of 12% and indicates that the rest of the province is nearly stable so far as its original territory is concerned.[15] Luxembourg reached its maximum in 1910. Since the War period, little suggestion of the resumption of growth is observable. Decline is to be noted in the 1920–1930 decade and a slight recovery is indicated in

[11] *Cf.* Kendall, H. M., "Notes on the Population of France, with special reference to the Population of the Aquitain Basin," *Papers of the Michigan Academy of Science, Arts and Letters,* 22: 373–384.

[12] Because of the use of several languages in Belgium, many of the place names have several variants. Throughout this paper, the name used for any place will follow local usage in the place itself except where there is a well recognized English equivalent. For example, the name referred to here is commonly used in English, but the Flemish equivalent is Antwerpen whereas the Walloon equivalent is Anvers. Though Antwerp is in the Flemish part of Belgium the names Antwerpen and Anvers are both in common usage.

[13] Census of 1920.

[14] "Relevé officiel etc." See footnote 2.

[15] It has frequently been suggested that the gain is largely the result of active immigration from adjacent parts of Germany. If this be true, the further suggestion is made that the change is purely political in its origin. It can therefore not be considered as comparable to other changes within the Belgian sphere.

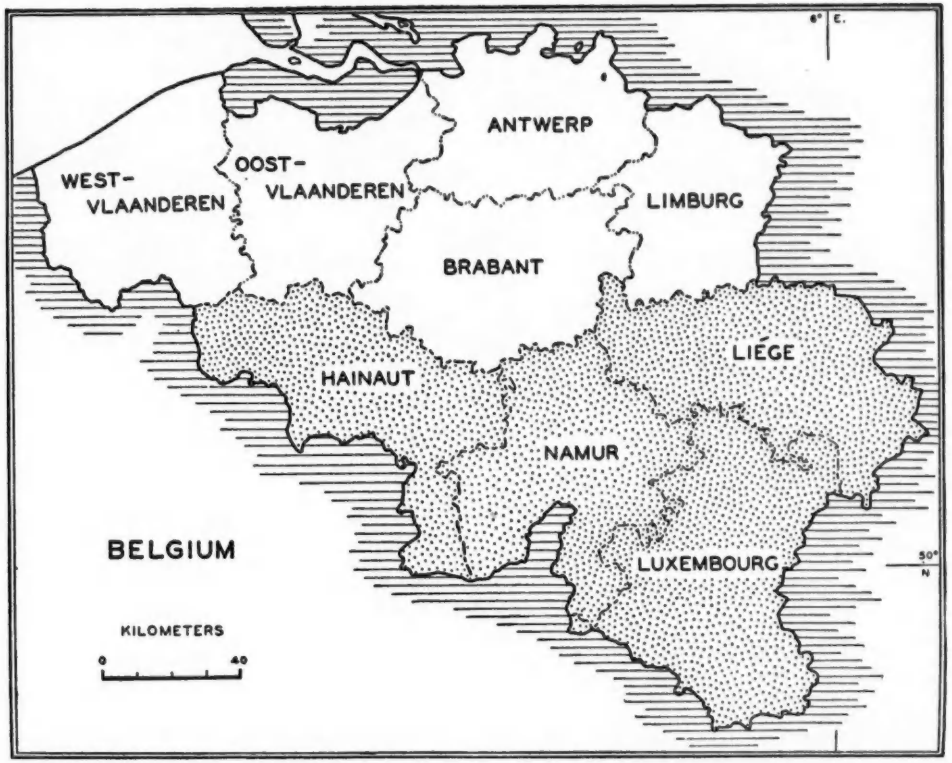


FIG. 2.—The provinces of Belgium. Provinces in white show continued growth of population through 1935; provinces with dot symbol show a decline of from 1 to 25% from the peak number.

the five years, 1930–1935. Namur lost during the War decade, but, though it has been extremely slow, there has been continued growth since 1920. Antwerp, Brabant, Limburg, Oost-Vlaanderen, and West-Vlaanderen may be classed as showing continued growth, and the other provinces must be classed, temporarily at least, as relatively stable.

When these categories are plotted on a map (Fig. 2), it appears that the northern and western parts of Belgium are contributing to the continued growth whereas the southern and eastern parts are more or less stagnant.

While the picture of population changes during the ninety-year period 1846–1935 begins to emerge when the basis of examination is the province, a much more accurate image is obtained when a greater degree of detail is used. The communes provide the finer grade. The population curve of each commune was examined and the category of growth was determined according to the Dodge method.[16] Because of the fact that only the ninety-year portion of the whole growth was considered, there were no communes which fell into the category described as *irregular*.[17] Thirty-five per cent of all the communes exhibited continued growth, 48.6% showed a decline of less than 25% from a peak, 15.7% showed a decline of between 25% and 50% from a peak, and .7% showed a decline of more than 50% (Table I).

TABLE I

CATEGORIES OF GROWTH
NUMBERS OF COMMUNES

Province	*Arrondisement*	*Categories**			
		A	B	C	D
Antwerp	Antwerp	53	6	0	0
	Malines	36	4	0	0
	Turnhout	47	3	1	1
Brabant	Bruxelles	82	38	1	0
	Louvain	82	37	0	0
	Nivelles	16	62	29	1
West-Vlaanderen	Bruges	19	21	2	0
	Dixmuide	2	21	4	0

(*Table continued on page 153*)

[16] Dodge, S. D., *op. cit.*: 200.

[17] In the examination of the curves of the communes and in the classification of the communes into the various categories, slight irregularities introduced by the World War were not considered as characteristic features. When decline was indicated in the 1920 census and when that decline was followed by an increase comparable to the increase previous to 1910, the interruption was not considered to be permanent. When there was no indication of the resumption of growth, the interruption was considered to be very significant in the determination of the category into which the commune was placed.

FIG. 3.—Population growth categories: 1, continued growth through 1935; 2, less than 25% decline from a peak number; and 4, decline of 25 to 50% from a peak number; 3, decline of over 50% from a peak number.

TABLE I.—Categories of Growth.—(*Continued from page 151*)

	Ypres	4	33	6	0
	Courtrai	29	13	4	0
	Ostend	12	13	2	0
	Roulers	8	11	1	0
	Thielt	7	12	0	0
	Veurne	6	10	13	0
Oost-Vlaanderen	Alost	50	29	2	0
	Audenarde	13	27	20	0
	Dendermonde	19	9	0	0
	Eecloo	7	11	0	0
	Ghent	33	39	10	0
	Sint-Niklaas	17	10	1	0
Hainaut	Ath	3	22	35	3
	Charleroi	13	57	2	1
	Mons	12	58	11	0
	Soignies	10	26	15	2
	Thuin	13	51	20	0
	Tournai	17	39	31	2
Liége	Huy	13	53	15	0
	Liége	43	63	8	0
	Verviers	31	45	13	0
	Waremme	16	65	7	0
Limburg	Hasselt	52	16	0	0
	Maeseyck	35	1	0	0
	Tongres	62	36	4	0
Luxembourg	Arlon	4	12	6	1
	Bastogne	5	27	3	0
	Marche-en-Famenne	7	29	18	0
	Neufchateau	11	47	17	1
	Virton	5	23	16	1
Namur	Dinant	14	75	49	3
	Namur	18	88	30	0
	Phillipeville	7	57	23	2
Totals for the country		933	1300	419	18
Percentage of the total		35.0	48.6	15.7	0.7

* Category A—continued growth; B—less than 25% decline from a peak number; C—decline of 25 to 50%; D—decline over 50%.

When these categories are plotted on a map (Fig. 3), the general pattern indicated by the changes on a province basis is reproduced, but there are several significant differences. The south-eastern part of the country shows a general fabric of stability. This fabric is eaten away in certain spots and in others it shows still the activity that characterizes the northern part of the country. In the classification by provinces, no part of the country shows active decay, but in the classification by communes some centers of decay become evident. Characteristically, the spots of active decline form centers

FIG. 4.—1, areas of increasing population; 2, areas of stable or declining population; 3, language frontiers; Fl, areas of Flemish speech; Fr, areas of French speech; G, areas of German speech.

around which there is evidence of beginning decline. Still further from the centers, there are indications of arrested growth and, beyond this latter zone lies the area where continuous growth gives evidence of that portion of the country which accounts for the continued upward sweep of its population growth curve. In the western part of the country, there is a striking deviation from the picture created by the province classification. Oost-Vlaanderen and West-Vlaanderen are both provinces that show continued growth, but when the province pattern is broken down into one on a finer grid there are distinct areas showing stability and some showing decline.

LANGUAGE FRONTIERS

For purposes of comparison with certain cultural differences within the country, it is desirable to indicate the position of the language frontiers with regard to the areas of growth and the areas of decline. Within Belgium, two languages are quite commonly used and a third is employed by an appreciable number of people. Flemish is used by 51.1% of the people in their everyday lives, 43.4% use French, and 1.2% use German.[18] Census data make possible the determination by communes of the percentages of the total population using each of these languages. A language frontier may be defined as a line separating the area in which over 50% of the people use one language from one in which over 50% of the people use another language. When the percentages are plotted on a map of communes, the frontiers may be drawn. The east-west boundary (Fig. 4) separates Flemish speaking Belgium on the north from French speaking Belgium on the south. The north-south boundary separates the area of German speech on the east from that of French on the west. Two exclaves of French speech are to be noted; one centers on Bruxelles in the Flemish section, the other on Arlon in the German section. The close correlation between the areas of relatively stable population and the areas in which French is the common language may be noted. A large portion of the increase in population is found in the Flemish portion of the state.

The reasons for the continued growth of the Flemish portion of the country and for the stagnation of the French portion cannot be considered solely as functions of the language or of the traditions implied. There has been a definite trend of population away from agricultural pursuits and toward those of commerce and industry.[19] Most of the centers of commerce and industry are located in the Flemish-speaking portion of the country. Antwerp, which is the country's major port, forms the center of commercial concentration while the recent opening of the Campine coal

[18] *Annuaire statistique*, etc.: xxii. See footnote 1.

[19] Michotte, P. L., "La Belgique, est-elle surpeuplée?" *Bulletin de la Société belge d'Études géographiques*, 4: 143.

field[20] in the vicinity of Genck is a basis of attraction industrially in the northeastern part of the country. Within the French zone, the mining and industrial centers of Charleroi, Namur, and Liége are the nuclei of still growing regions. The presence of a larger proportion of the agricultural land in the French-speaking than in the Flemish-speaking sections would also indicate that a loss of population in the former area is to be expected with the continued emphasis on commerce and industry.

In both of the outliers, Bruxelles and Arlon, the governmental and military functions suggest reasons for the prevalence of French. The current position of that language, as one used by a large number of people outside the direct confines of France, has led to its common use in the official world of Belgium.

PEAK DATES IN POPULATION GROWTH

In the further analysis of the character of population change, it is desirable to inquire whether or not there is any specific time at which the peak figure was reached in the numbers of people in each commune. The 933 communes that have shown continued growth through 1935 may be eliminated simply because they may be considered as not yet having reached a peak. Of the remaining 1737 communes, 395 or 22.7% show a maximum in the 1910 census (Table II). The larger number of these were in the

TABLE II

DATES OF PEAK POPULATION

NUMBERS OF COMMUNES

	1846	1856	1866	1880	1890	1900	1910	1920	1930
Antwerp						1	3	5	6
Brabant	24	7	11	18	7	9	35	19	38
West-Vlaanderen	38	6	3	5	16	11	61	18	8
Oost-Vlaanderen	63	1	1		5	7	44	27	10
Hainaut	104	23	23	31	16	29	62	16	71
Liége	17	9	12	17	33	29	84	19	50
Limburg	1	2	2	1	5		8	9	29
Luxembourg	20	22	28	13	11	16	52	30	9
Namur	17	29	56	57	38	38	46	17	29
Belgium	284	99	136	142	131	140	395	160	250

[20] The Campine field was first worked in 1901, but it did not assume any considerable importance until after the World War. See Legraye, M., "Étude des charbons du bassin houiller du nord de la Belgique," *Revue universelle des Mines*, Feb. 1936, 8e Série, Tome XII, No. 2: 2–12.

provinces of Liége, Hainaut, and West-Vlaanderen. The first two of these provinces include a large part of what were then the coal mining and industrial zones while the latter is the area in which most of the fighting on actual Belgian territory was carried on. During the Occupation, the decline of activity in the first two provinces was marked while in the latter province many of the inhabitants were evacuated. Readjustment following the War involved reorientation of commerce and industry. Decline in relative importance of the Hainaut coal areas, particularly in the Borinage, coupled with the opening along expanded lines of the Campine field made the decline in many places a permanent one. Resumption of growth has been confined to the major industrial centers grouped about Charleroi in Hainaut and about the city of Liége in that province. West-Vlaanderen was an agricultural region in the main and its failure to resume growth may be interpreted as an indication of the trend away from rural life.[21]

The high number of communes showing a peak of population in 1930 in the provinces of Hainaut and Liége may be taken as further indication of the increase in importance of the Campine coal field. Miners are being drawn into the new field from the older ones that are showing gradual signs of declining yield.

The high numbers of communes reaching peaks in 1866 and 1880 in the province of Namur are correlated with the beginning decline of the coal deposits within that province as well as with the movement toward the urban areas. It may be pointed out that this movement is not in the bulk toward the larger communes, but rather toward those intermediate in size, from 25,000 to 100,000.[22]

When maps are constructed indicating the date of peak populations, there is shown no concentration of areas of maximum other than in a very general sense. This condition can only be interpreted as indicating the weakness of this line of approach. The map for 1846 indicates perhaps more completely than any of the others a region which had reached a peak. The validity of use of this map in the study of population changes for the period beginning in that year appears very slight. It is recognized that the condition in 1846 was merely a point on a continued curve and that it must be used simply as a point on that curve from which to begin the investigation. The map for 1910 does indicate parts of the country which were permanently conditioned by the World War. Beyond these two maps, the dates of peak population when plotted areally have little regional significance.

RATES OF CHANGE

In the further attempt to measure the changes which have taken place

[21] Michotte, P. L., *op. cit.*: 151.

[22] Michotte, P. L., *loc. cit.*

and to secure some suggestion of the trend in the immediate future, it seemed desirable to compare the growth curve of separate communes with that of the country as a whole. This led to the recognition of four main classes of change: 1) those communes which have shown growth at a rate faster than that for the whole country; 2) those that have grown, but slower than the country as a whole; 3) those that have remained essentially stable in numbers; and 4) those that have shown an actual decline.

It was found necessary to determine an index of growth for each commune for the purpose of plotting these classes on a map. The index was determined by dividing the population of each commune as listed in 1935 by the population of the same area in 1846. The country as a whole shows the index 1.91. Class 1 includes those communes for which the index is greater than 1.91; class 2, those in which the index is between 1.91 and 1.05; class 3, those between 1.05 and .95; and class 4, those in which the index is less than .95. In all instances except the 31 communes which were added to Belgium at the end of the World War, it was possible to secure the population number for 1846. There have been relatively few changes of commune boundaries and what changes there have been are all carefully specified so that there is no difficulty in securing comparable data for the two years in question. In the territory which was added to the country, records of areal changes are not available. Consequently, the eastern fringe of the country has been omitted from this line of study.

Some of the communes show an index almost exactly the same as that for the country as a whole. Actually, the number of communes for which the index was between 1.95 and 1.85, that is, within .05 of the base figure, was 80 out of a total of 2670. It seemed unnecessary to recognize a separate category in this scale of study for so small a number of communes. On the other hand, 264 communes had an index between 1.05 and .95; that is, had essentially the same population in 1935 that they had in 1846. Since this represents nearly 10 per cent of all the communes and since it represents a condition of dormancy, it was thought significant in the complete picture.

The classification of communes into the four categories brought out the facts that 566 or 21.3% were growing faster than the country as a whole, 1130 or 43.1% were growing at a slower rate than the country, 264 or 10% were stable, and 679 or 25.6% were declining (Table III). Plotting these on a map (Fig. 5) brought out certain very definite areas of rapid growth and others of permanent decline, both classes arranged on a background of stable or slowly growing country.

AREAS OF DECLINE

The areas of declining population are scattered quite widely over the

TABLE III

Rate of Growth

NUMBERS OF COMMUNES

Province	*Arrondisement*	*Classes**			
		1	2	3	4
Antwerp	Antwerp	46	13	0	0
	Malines	15	24	1	0
	Turnhout	23	29	0	0
Brabant	Bruxelles	54	50	6	10
	Louvain	24	88	3	4
	Nivelles	11	27	18	52
West-Vlaanderen	Bruges	9	24	5	4
	Dixmuide	0	9	3	15
	Ypres	4	17	9	13
	Courtrai	12	17	4	13
	Ostend	9	12	3	3
	Roulers	3	5	7	5
	Thielt	0	5	6	8
	Veurne	4	6	5	14
Oost-Vlaanderen	Alost	18	54	5	4
	Audenarde	3	18	7	32
	Dendermonde	9	15	3	1
	Eecloo	1	9	3	5
	Ghent	9	36	13	24
	Sint-Niklaas	2	23	2	1
Hainaut	Ath	0	7	7	49
	Charleroi	44	22	3	4
	Mons	20	34	7	20
	Soignies	16	12	3	22
	Thuin	12	32	6	34
	Tournai	4	26	10	49
Liége	Huy	9	45	13	14
	Liége	49	47	10	9
	Verviers	15	17	4	22
	Waremme	12	57	8	11
Limburg	Hasselt	35	33	0	0
	Maeseyck	24	12	0	0
	Tongres	17	73	3	9
Luxembourg	Arlon	4	9	0	10
	Bastogne	2	22	4	7
	Marche-en-Famenne	5	15	7	27
	Neufchateau	5	36	8	27
	Virton	1	11	6	27
Namur	Dinant	9	56	26	51
	Namur	22	53	18	43

(*Table continued on page 161*)

FIG. 5.—Rates of population growth: 1, growth index over 1.91; 2, growth index 1.91 through 1.06; 3, growth index 1.05 through .95; 4, growth index below .95; and 5, data not available.

TABLE III.—RATE OF GROWTH.—(*Continued from page 159*)

	Phillipeville	5	30	18	36
Total for country	.....	566	1130	264	679
Percentage of the total	.....	21.3	43.1	10.0	25.6

* Class 1 shows index above 1.91; class 2, 1.91 through 1.06; class 3, 1.05 through .95; and class 4, below .95.

country, but they do show certain focal sections. In the extreme western part of Belgium, decline centers on the urban area of Veurne, Dixmuide, and Ypres. The polder section of the Flanders Plain will be remembered as the actual scene of activities during the War. Military measures, such as the flooding of a large portion of the lowland of the Yser River, brought about widespread destruction of soil fertility. This coupled with relocation of property lines and reorientation of agricultural methods suggests the background of explanation of the population decline in this area. Some thirty kilometers to the east, in the zone between Ghent and Bruges, there is another small area of decline. As in the first instance, this is an agricultural district. The decline is closely related to declining soil fertility. The largest of all concentrated areas of decline forms a broad zone extending approximately from Courtrai on the west nearly to Bruxelles on the east. It lies north of Tournai and north and northwest of Mons. It includes the urban areas of Audenarde and Ath. The whole strip, except for a few isolated communes, lies north of the coal zone and is almost exclusively an agricultural region. The fourth concentrated section of decline is in southeastern Brabant and northeastern Namur provinces; again agriculture is the pursuit of the larger number of inhabitants. In the southeastern part of Belgium, the communes showing decline do not form such clear-cut regions. In the territory lying between the Sambre-Meuse lowland and the north face of Ardenne Plateau, and likewise in the area lying along the southern edge of the Plateau, notably in the valley of the Semois River, decline is apparently counteracted by growth in contiguous communes. Specialization in the production of tobacco[23] has tended, along with other changes in agricultural practice, to decrease the labor demands and thereby to aid the cityward migration which is apparent throughout the whole land. The declining sections north of the Ardenne Plateau are again in agricultural areas. The areas of decline are definitely associated with agriculture except in a few isolated places.

AREAS OF GROWTH

Quite in contrast to the distribution of areas of decline, the sections showing most active growth are related in a large part to the urban nuclei

[23] Fontaine, F., *Vresse et LaForêt sur Semois*, Gembloux, 1924: 10.

of the industrial and commercial parts of the country. Certain particular areas may be noted. To the west and south of Courtrai, along the boundary with France, lies one of these areas separating two sections of decline. With reference to Belgium alone, the growth is not fully understandable, but, when conditions on the French side of the boundary are examined, it is found that the important manufacturing center of Lille occupies the embayment in the Belgian frontier. Growth in Belgium is directly related to this center. The political boundary has interefered little with the development of a continuous industrial region where many workers live in one country and work in the other.[24] Prominent also as an area of rapid population increase is the almost continuous band stretching along the valley of the Sambre River from west of Mons nearly to Namur. Close association of the area of rapid growth and the area of coal deposits is evident. Some decline is shown south of Mons, in the Borinage, and a larger area of rapid increase near Charleroi may be distinguished, but, though there are variations from place to place, the whole coal basin shows a growth considerably in excess of that of the country as a whole. The pinching out of this zone in the vicinity of Namur is a reflection of the structure of the coal deposits and of the fact that they have virtually been depleted in that locality.[25] With the resumption of the importance of coal near Liége, there is another center of rapid population increase. Rapid growth accompanied by changing economy[26] is demonstrated in much of the land in the northeastern part of the country. More particularly it is centered on the commune of Genck where the greater part of the work of actual development of the Campine coal field is progressing. The growth of the commune of Genck was very slow until 1918 after which date the population has increased more than sevenfold.[27] Throughout the Campine, rapid population growth is associated with either the working of the coal deposits, the building and operation of the Canal Albert,[28] or various government projects.

[24] Gottschalz, M., "Notre vie sociale," *Encyclopédie Belge,* 1933. Ch. V: 274. The *Encyclopédie Belge* contains many chapters that have a bearing on population problems in Belgium. Chapter IV, "Notre vie économique" by twelve different authors and chapter VI, "Notre vie communale et provinciale" by J. Lespes are particularly applicable.

[25] Michotte, P. L., "Les régions houilleres de Haine-Sambre-Meuse," *Bulletin de la Société belge d'Études géographiques,* 4: 45.

[26] See Dussart, F., "Les landes campinoises et leur mise en valeur," *Comptes Rendus du 2me Congrès National des Sciences,* 1935: 1641–1646.

[27] The character of this growth is fully treated in Mouchamps, L., *L'habitat dans le bassin houiller de Campine,* Cercle des Géographes liégeois, fasc. 10 des Travaux, et Travaux du Seminaire de Géographie de l'Université de Liége, fasc. XXX, Liége, 1931.

[28] An account of the Canal Albert is to be found in "Un bulletin de Victoire aux travaux du Canal Albert," *L'Avenir belge,* 42nd year, No. 45, 1934.

The remaining areas of rapid growth are with one exception the suburban zones of Antwerp, Bruxelles, Louvain, Ghent, and Bruges. In those places, there is some slight increase in the heart of the city, but the narrow confines of the communes has prevented any very rapid increase. The agglomerations have rather spread so that the geographical city in each instance includes several communes.[29] Of somewhat different aspect from the other large centers is Bruges. The core of the city has changed little in population from 1846 to 1935. Some of its suburbs have even declined, but there is observable some rapid growth to the south and east of the center. The earlier port character of Bruges and the present shift of emphasis are in some measure responsible. So long as the connection with the sea was the dominant factor, growth to the north was especially significant. Now, the main railway line from Ostend to the interior of the country passes to the south and east and its attraction has completely overshadowed that of the water connections. The exception to the suburban growth is shown along the coast. There rapid growth is stimulated by the increasing recreational use of the area. The Belgian coast has become one of the most frequented of European recreational areas for the summer period. The large increase in numbers of seasonal visitors has brought about a need for services demanding a larger population.

Outside of the industrial areas, the suburban portions of the larger agglomerations, and the coastal strip, there are some isolated communes in the southeastern part of Belgium that have shown rapid growth of population. Many of the communes where this has happened owe the change to the increased recreational function which they perform. In other places, unattached industrial and commercial nuclei have sprung up. In Athus, the southeasternmost commune in the country, for example, the change has been occasioned largely by the increased importance of iron mining.[30]

CONCLUSION

The population record of the country displays areas of marked deterioration which show strikingly against the general background of growth. Instead of a simple picture of Belgium as a land throughout which a constant growth of population can be observed, one sees that only in certain parts of the country does this hold true. While the sum total of change indicates a

[29] The geographical city of Bruxelles, for example, includes most of the territory of the communes of Anderlecht, Auderghem, Bruxelles, Etterbeek, Forest, Ixelles, Jette, Koekelberg, Molenbeek-St.-Jean, St. Gilles, St. Josse-ten-Noode, Schaerbeek, Uccle, Watermael-Boitsfort, Woluwe-St.-Lambert, and Woluwe-St.-Pierre.

[30] *Cf.* Michotte, P. L., "Les sites charbonniers de l'industrie de la fonte et de l'acier des bassins houillers franco-belge et sarrois," *Bulletin de la Société belge d'Études géographiques*, 6: 107–130.

positive advance, yet the detailed picture reveals a certain unevenness. Decline is uniformly associated with agriculture whereas four kinds of areas are foci of increase. They are: 1, the coal fields; 2, the suburban areas of the larger cities; 3, the coastal zone; and 4, a heterogeneous group of areas in the southeastern part of the country, most of them resort centers. The reasons for exceptional growth or for decline as well can not be considered wholly from the point of view of Belgium as a detached unit. The economic relationships with surrounding countries as well as with others more distant have had effects which have undoubtedly helped in producing the changes observable in the population picture of the ninety years, 1846 to 1935. Yet, it is the changes themselves which form the base for an understanding of the varied landscapes of present-day Belgium.

University of Michigan,
March, 1938.

Six Standard Seasons of the Year

RICHARD HARTSHORNE

THE SCIENTIFIC NEED FOR STANDARD SEASONS

Scientific advance in the systematic branches of geography is an essential prerequisite for any studies in comparative regional geography. Notable advance has been made in this respect in the development of scientific measurements of climates. We have been given terms, concepts, and types which can be quantitatively defined and which therefore enable us to express briefly the climatic characteristics of any place, and thereby compare them with those of another place. Most of these terms—precipitation efficiency, temperature efficiency, length of growing season and the like—as well as the types based upon them, have been developed largely in consideration of the effects on vegetation, whether natural or cultivated. Granted that these effects are fundamental in respect to land use and therefore to our economic life, other aspects of climate likewise have geographic importance. The temperature conditions of different times of the year have marked effects upon our comfort, the clothing we must wear, our outdoor activities, and the heat requirements of our houses and of our automobiles. The student of landscape phenomena can observe these effects in the character of houses and barns and more directly in the appearance at different times of the year, of roads and streets, rivers and lakes—in general of the visible landscape.

These temperature differences in different parts of the year, which vary in character and length in different parts of the world, are not described in terms of temperature efficiency nor even of length of growing season. Differences in temperature range in different parts of the growing season, roughly expressed in terms of "moderately warm" temperature and "very hot temperature," have important effects on our way of life which are reflected in the structure of our homes. Likewise in the opposite time of the year a period of severe cold, associated with icy pavements and snow-covered sidewalks is very different from "moderately cold" periods in which snow and ice are less common, even though frosts are sufficiently frequent to prevent vegetative growth.

This concept of seasons based on differences in temperature range is recognized in ordinary usage of the names of seasons: winter, spring, summer, and fall. Throughout most of the important populated areas of the

world—the areas inhabited by the people of our interest, as Jefferson puts it[1]—seasonal differences are primarily differences in temperature. But common usage in these areas has not provided even approximate definitions for these terms. To reduce vague popular concepts of reality to specific terms that can be quantitatively determined, so that one year may be compared with another, and so that average conditions in one place can be compared with those of another place, is the task of science, in this case clearly of a geographic science of climatology. Since the writer is not a climatologist and has made no thorough study of the climatic factors involved, no attempt will be made to present final criteria for the seasons. This paper is concerned with the seasonal division of the year which appears logically necessary, and will only suggest criteria for the consideration of those competent to decide upon them.

The astronomers, to be sure, have defined the seasons for their purposes, and since no other science has attempted to do so, these definitions are carried over into the popular science of the newspapers. But it is simply a confusion in terms when the papers proclaim the arrival of spring on March 21st, whether in Winnipeg where the ground may still be covered with snow, or in Nashville where vegetation may have been in full bloom for several weeks. Whether for the layman or the geographer, the seasonal names mean something quite different from what they mean to the astronomer; if we are to recover these terms for our uses, we must define them in our sense.[2]

A LOGICAL BASIS FOR SEASONAL DIVISIONS OF THE YEAR

A major division of the year into two parts may be clearly recognized in all humid regions of marked temperature range—the lowland regions between the tropics and the permanent ice areas. The part of the year in which temperatures are consistently above the freezing temperature of water is approximately the growing season, the period of vegetative life in

[1] Jefferson, Mark: "Standard Seasons," *Annals Assn. Amer. Geogrs.* 28(1938) 1–12.

[The article here published was already in preparation when Professor Jefferson presented his paper at the December, 1937, meeting of the *Association*. It was in the editor's hands before its author had seen the published study by Jefferson—one more case of simultaneous, independent evolution of the same topic in different minds. It has since been somewhat revised so that it may stand as a continuation of the discussion broached in the earlier paper.—*Editor.*]

[2] As this goes to press my attention has been called to Angot's method of classifying summers and winters—translated in U. S. Weather Bureau: *Mo. Wea. Rev.* 42(1914), 625–629—and to Alciatore, Henry F.: "Classification of American Summers," *ibid.*, 43(1915), 400–402. Although neither of these authors attempts to define the seasons, both submit criteria which might conceivably be useful for that purpose.

the landscape. (We commonly assume such conditions when the monthly mean is not below 50° F., the limit used by Jefferson for the period of "frigid winter.") With the arrival of frosts the green vegetation largely disappears; whether natural or cultivated the landscape around us remains lifeless through most of this period. This latter season of the year, when temperatures frequently drop below 32° F., was the winter of the Greeks and Romans (*hiberno,* in Latin). In various parts of the Mediterranean world it lasted for from two-and-a-half to four months, thus leading to the idea that winter constituted about one-fourth of the year, an idea which we have hardly outgrown even though we may live where such conditions actually last for half the year.

The warm part of the year, that in which frost is absent, was originally divided into but two seasons: an earlier portion in which vegetation began to bloom, "spring," and the remainder, summer (*aestas,* the hot or "burning" season). Later, the latter portion of the summer was recognized as a separate season, autumn.[3] Spring and autumn were seasons of warmth, but not of high temperatures. In the Mediterranean, these seasons lasted, as it happened, for approximately equal periods, each about one-fourth of the year.

In northern Europe, however, the division of the year into four seasons resulted in very different kinds of seasons. In areas of Germanic culture there was no hot or "burning" season corresponding to the *aestas* of the Mediterranean lands. Summer in Germany corresponds, in temperature conditions, to the spring and autumn of peninsular Italy and Greece. The opposite season of coldest temperatures introduces landscape characteristics essentially unknown to the Mediterranean world, namely, snow covered fields, ice on lakes and streams, continuously frozen soil in fields and dirt roads, and city sidewalks and streets that must be cleared of snow. This is the concept of "winter" as understood in a large part of Germany, where it may last a full fourth of the year; and it is of course familiar to us in northern United States. When the day and night temperatures rise above an average of 32° F., so that thaws predominate over frosts, everyone recognizes a significant change in season. Though vegetation has not yet begun to bloom, so that Romans would still call it *hiberno,* frozen fields and roads change to mud, "the frost goes out of the ground," snow disappears,

[3] From the Latin, *autumnus,* the origin of which is somewhat obscure. It is believed to come from a Greek verb, of Sanscrit origin, which means "to be well off," and therefore meant presumably "the season of abundance." Roman writers of the first and second century, A. D., confused it with *auctumnus,* from the verb *augeo,* to increase, hence the harvest season, whereas properly understood it implied the season when all the harvests were in. Lewis and Short: *Harper's New Latin Dictionary* (New York, 1907).

and snow-shovels are put away for the year—although we know snow may still fall, we trust to a rise in temperature to take care of it—heavy overcoats are exchanged for topcoats, winter goloshes are no longer needed, fur-caps and ear-muffs can be dispensed with. In all these respects the winter is over. This transitional season, which in northwestern Europe may last for a fourth of the year, is often referred to there (and in northern United States) as "early spring." The corresponding season later in the year, between the warm summer and the cold winter, may be of equal length; the Saxons correctly called this season "fall," the season when frost caused the leaves to fall, and this term, which was used in England until replaced by the Romance word "autumn" in modern times, is still the common term in America. Mediterranean peoples however would recognize this season as *hiberno,* winter, whereas the season we think of as winter has not yet begun.

In most of northwestern Europe this four-season cycle formed a fairly satisfactory division of the year. The fact that it consisted of quite different seasons from those of the four-season cycle of the Mediterranean lands disturbed only those few people who were interested in both areas. But if we are to standardize seasons, so that we can compare them in different regions, we shall need more than four seasons in order to recognize four in each of these areas.

It is possible to combine these two concepts of the seasons by recognizing four *kinds* of seasons, based on range of temperature. Fortunately we have four convenient terms for these, which can be appropriately defined. The "cold" season is that in which mean daily temperatures are below 32° F., so that snow and ice predominate. "Cool" seasons are those in which temperatures average above 32° F., but below 50° F., *i.e.,* when frosts occur but do not predominate. "Warm" seasons are those in which average temperatures are above 50° F., but below 68° F., *i.e.,* seasons essentially free of frost, but mostly without high heat.[4] The "hot" season is that in which average temperatures are above 68° F. This figure is chosen as the limit above which people are either comfortable or too warm without artificial heating. Jefferson has chosen the same figure; whether some other limit, such as 64.4° F., or 71.6° F., would be better is left undecided. I have simply chosen the limits that are in common use. They have the virtue of corresponding to 0°, 10°, and 20° on the Centigrade scale.

This scheme could be carried farther, if one wished, by recognizing a season of "dead winter" in which temperatures above freezing were essentially unknown, a season then of continuous frost. This is found if the

[4] Such seasons will not be entirely free of frosts in all regions, since in some areas, I understand, frosts occur in months whose means are above 50° F.

average temperature is approximately below 14° F. (−10° C.). Similarly a season of continuously hot temperatures might be found where the average temperature was, say, above 86° F. (30° C.). The latter kind of season would be confined to the low latitudes; the former is found in few important regions in the world, though it does form a definite characteristic of such areas as the Central Northwest of the United States, lasting at Minneapolis for an average of six weeks without thaw. In any case, however, the differences recognized by these periods are minor, so that they are not used in this suggested classification.

THE TEN TYPES OF SEASONAL CYCLES

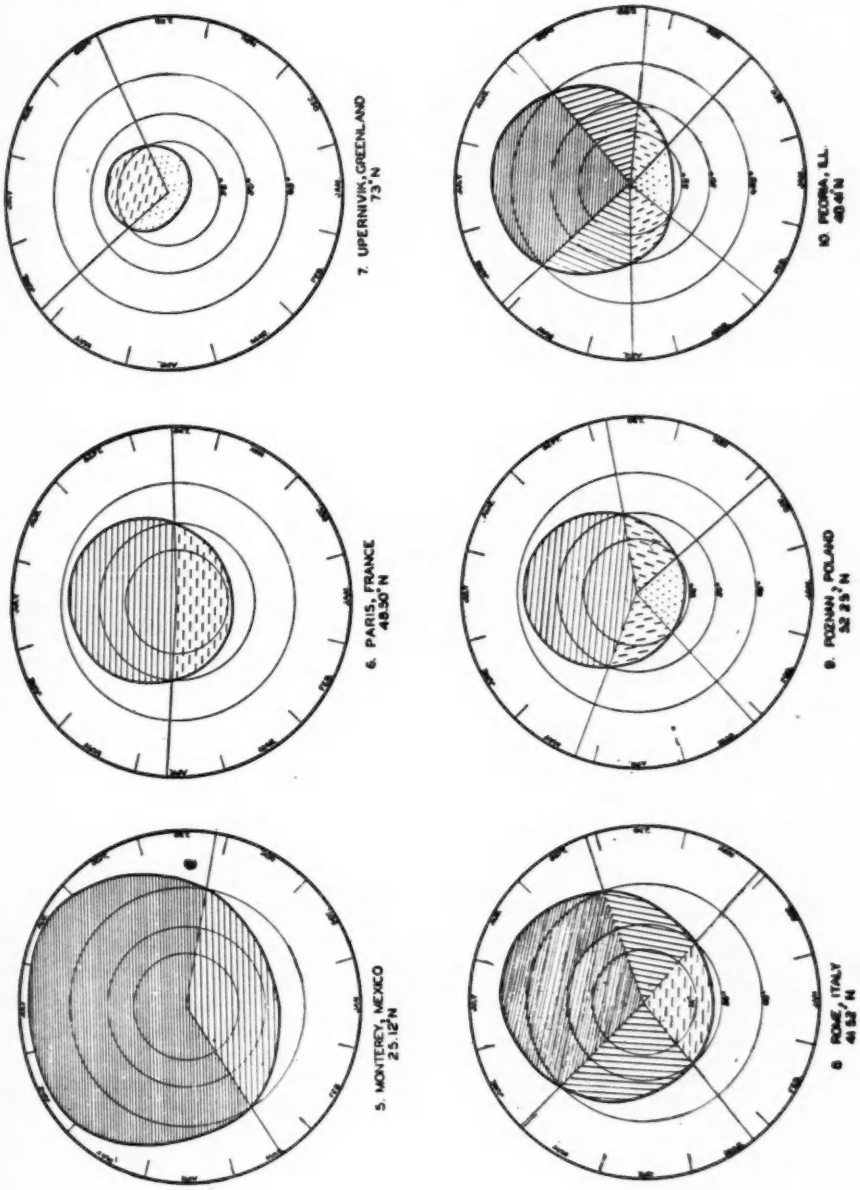
Limiting ourselves to the four kinds of temperature seasons listed above, it is clear that there are many possible combinations of these which may be found in different parts of the world throughout the course of the year. These combinations are shown, with typical examples, in Figure 1. A particular locality may be limited to but one kind of season. Stations in the equatorial lowlands are, of course, hot all year; (Type 1, Fig. 1); those in the ice areas are cold all year (Type 4). Few lowland places are warm all year (Type 2) or cool all year (Type 3), but these types are important in the tropical highlands. Most of the inhabited parts of the Andean and Mexican highlands would probably be included in Type 2. There are three possible combinations of a year consisting in each case of but two seasons (Types 5, 6, and 7), and two possible combinations of three kinds of seasons (Types 8 and 9). Coming in sequence three kinds of seasons form a four-season cycle. These two distinct four-season cycles prevail in most areas of European culture (Fig. 2). Very few parts of the world have all four kinds of seasons, the complete range from hot to cold (Type 10); in sequence—hot, warm, cool, cold, cool, warm—these form six seasons of the year, such as we have in northern United States.

The following table shows the close relation between these types and Koeppen's climatic types, insofar as the latter are based on temperature.[5]

Koeppen System	Seasonal Cycle
A—coldest month over 18° C.	Hot, continuously
	Exceptional: Warm—hot
	Warm, continuously (18°–20° C.)
C—coldest month between 18° and −3° C.	
C a—warmest month over 22° C.	Cool—warm—hot—warm
	Equatorial margin: warm—hot
	Exceptional: cold—cool—warm—hot—warm—cool

[5] The exceptional cases noted in the table could be eliminated by taking the limits used in the Koeppen system: 64.4° F. (18° C.), instead of 68° F., for the hot season, and 26.6° F. (−3° C.), instead of 32° F., for the cold season. Whether these are more suitable limits on other grounds I am not able to decide.

FIG. 1.—Climatographs of typical stations of the ten types of seasonal cycles. The shading, from dark to light, represents the four degrees of seasons—hot, warm, cool, and cold.


7. UPERNIVIK, GREENLAND 73° N
10. PEORIA, ILL. 40.4° N
6. PARIS, FRANCE 48.50° N
9. POZNAN, POLAND 52.25° N
5. MONTEREY, MEXICO 25.12° N
8. ROME, ITALY 41.52° N

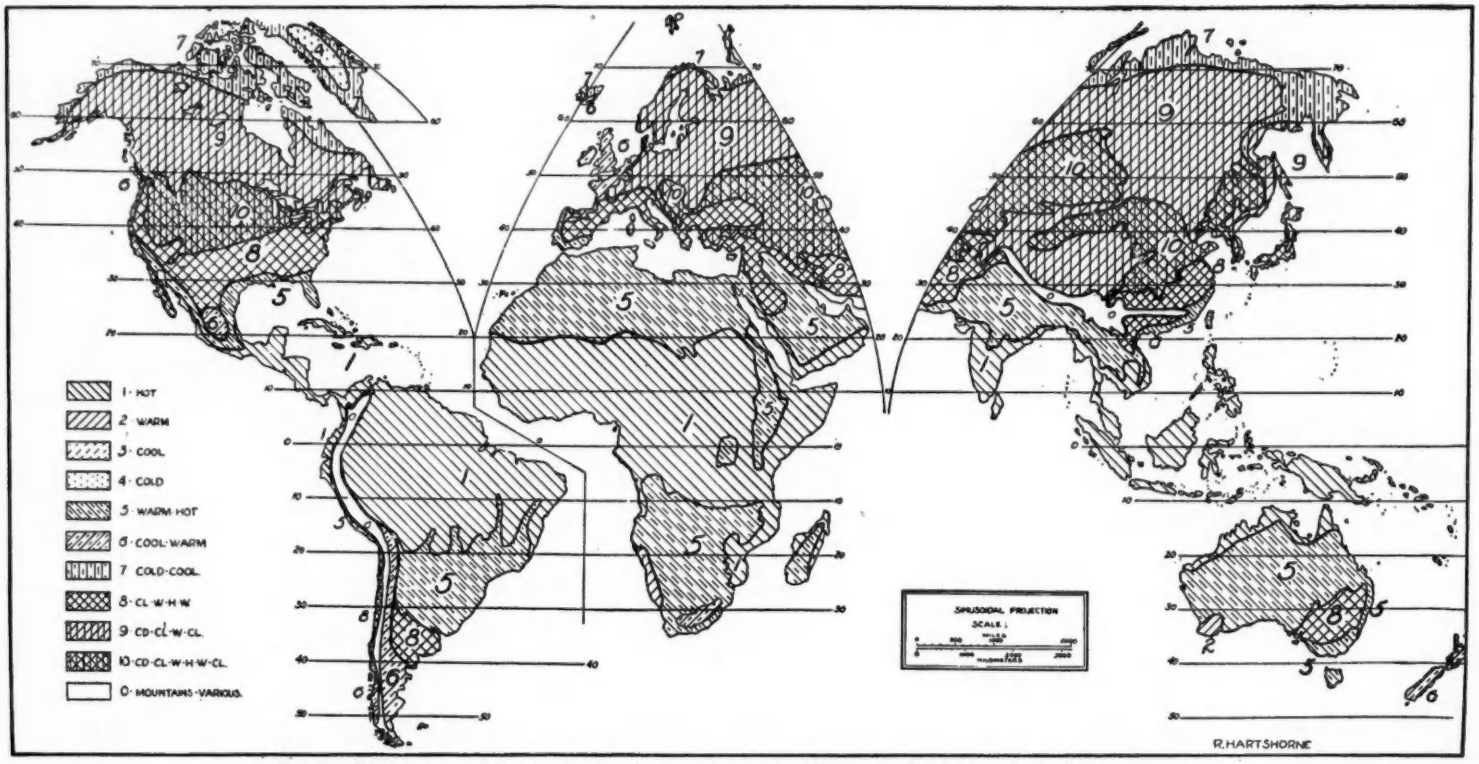


FIG. 2.—Distribution of the ten types of seasonal cycles. (Based on Bartholmew's isothermic maps.)

C b—warmest month under 22° C. at least four months over 10° C.	Cool—warm Tropical highlands, chiefly: warm, continuously Exceptional: Cool—warm—hot—warm Cold—cool—warm—hot—warm—cool
D—coldest month under −3° C., warmest month over 10° C.	
D a—warmest month over 22° C.	Cold—cool—warm—hot—warm—cool
D b—warmest month under 22° C. at least four months over 10° C.	Cold—cool—warm—cool Equatorial margin: Cold—cool—warm—hot—warm—cool
D c and D d— less than 4 months over 10° C.	Cold—cool—warm (short)—cool
E—Warmest month, 0°–10° C.	Cold—cool Tropical highlands, chiefly: Cool, continuously
F—Warmest month less than 0° C.	Cold, continuously.

The complete cycle of six seasons is found throughout the **Da** climates, but nowhere else in any marked degree. (Where found elsewhere, as noted above, either the hot or the cold season is very short.) It is therefore not surprising that the idea of six seasons has not developed previously, for until modern times these areas included few regions of important cultures. On the other hand, it is clear that most of the areas of important European culture, as well as most of those of Chinese and Japanese, have a four-season cycle. But these cycles are not everywhere the same, that of northern Europe, Type 9, being quite different from Type 8 found in the other areas.

In the more generalized system of seasons suggested by Professor Jefferson, it might be noted, there would be no difference between Types 3, 4 and 7, although the differences appear to be important, and only two seasons would be recognized in Type 9, in northern Europe.

The system of standardized seasons based on four ranges of temperature adds distinctly to our descriptive analysis of differences between the climatic types of the world. This additional information is particularly significant in the direct relation between human life and climatic conditions, as distinct from the indirect relation through agriculture.

Unfortunately, though we have four convenient terms to characterize the temperature ranges of these seasons, our vocabulary of seasonal names, based as it is on a four-season cycle, is inadequate for those of a greater or lesser number. In fact it is not even adequate for the four-season cycles since these include, among them, not four, but six seasons. Various attempts that I have made to develop a series of terms suitable for these six

seasons have not proved successful,[6] so that, for the present at least, I can only suggest the use of the descriptive temperature terms already defined: hot, warm, cool, and cold; where there are two seasons of the same kind they may be distinguished as "early" and "late," the reference being not to the common calendar, but to the period of extreme temperatures between them. Thus in the **Da** climates, as in northern United States, we have: the early warm season, the hot season, the latter warm season, the early cool season, the cold season, and the latter cool season. (A precedent for this usage is found in the Biblical reference to "early and latter rains." James 5: 7.)

The distribution of the ten types of seasonal cycles over the land areas of the world is shown in Fig. 2. (The Antarctic continent, not shown, is included entirely in Type 4.) Most of the areas are encompassed in five types: 1, 5, 8, 9, and 10. Large expanses of the areas in Types 5 and 10 are steppe and desert regions in which seasonal differences in temperature are of minor importance.

COMPARISON WITHIN A SINGLE CLIMATIC TYPE

The six-season standardized cycle of seasons is particularly useful in measuring differences within a single type of climate. Of two stations within the same type of climate one may have but a month of cold winter, the other may have more than five; to take a specific example: at both Chicago and Philadelphia the total frost season is approximately the same length, nearly six months; but whereas Chicago has three months of cold winter, Philadelphia averages less than one month and in some years has almost no ice and snow. Such a statement is much more significant in understanding differences in living conditions than a comparison of minimum temperatures.

In a rough way the length of the different seasons at any place can be approximated from the monthly average temperatures, but more reliable results can be obtained by drawing the temperature curve and noting where this cuts the limiting lines (32°, 50°, and 68° F., in my tentative placing). If the curve is plotted on a circular graph the relative length of the seasons is shown directly; it may be measured in days, as degrees of the circle (the difference between 365 and 360 produces a relatively insignificant inaccuracy).[7]

[6] For example: hot summer (or summer), warm summer (or autumn), fall, cold or frigid winter, cool or early spring, and warm spring; but where there is no cold winter we would have to speak of cool fall-spring, or mild winter. Attempts might be made to incorporate foreign words, such as *hiberno* for mild winter. I leave this to those more fertile in inventing terms.

[7] The temperature curves are based on a special type of graduation similar to

A number of contrasted stations are shown on the accompanying graphs, Fig. 3 for Type 10 (including stations in the **Da** climates), and Fig. 4 for Type 9 (stations in the **Db**, **Dc**, and **Dd** climates). In the former group, Boston was picked as having seasons most nearly equal in length, each about two months long. In striking contrast is Peking. Though located but slightly farther north, its marked continental character gives it a hot season of about four months and a cold season of about three months, so that each of the four intermediate seasons is but little over a month long. Piacenza, in northern Italy, at approximately the same latitude, has relatively long intermediate periods, a shorter hot season than Peking, and a particularly short cold season.[8] In marked contrast with it is Harbin, Manchuria, with more than five months of cold winter, but yet a hot summer of nearly two months. A graph made for Wheaton, Minnesota (not reproduced), is very similar to that of Harbin, so that the latter may be contrasted with that of Boston to measure roughly the difference in length of seasons, notably of cold winter, between the interior of North America and the eastern seaboard. The graph of each of these four stations should be compared with that of the more typical Peoria, Illinois (Fig. 1).

that used by John B. Leighly. ("Graphic Studies in Climatology," *Univ. of Calif. Publ. in Geogr.*, 2(1928), pp. 387–394.) Only on this basis does the slope of the curve correctly represent the degree of change in temperature from month to month. A table for the graduations may be easily constructed, if the distance from the center to 100° F. is taken as ten times the distance from the center to 0° F. If the latter distance is c, then the distance, y, for any temperature x° F., is given by the formula: $y = c \times \operatorname{colog} \frac{x}{100}$ Temperatures below zero, no matter how low, are marked between 0° F. and the center, for the center represents minus infinity. Following are the values for $\operatorname{colog} \frac{x}{100}$ which can be interpolated with inaccuracies of less than one hundredth of an inch, if c is approximately half an inch. These figures multiplied by the constant, c, then, give the distances from the center for the degrees F., indicated.

°F.	$\operatorname{colog} \frac{x}{100}$						
110	12.59	80	6.31	50	3.16	− 10	.79
105	11.72	75	5.62	40	2.51	− 20	.63
100	10.00	70	5.01	30	2.00	− 40	.40
95	8.91	65	4.47	20	1.59	− 60	.25
90	7.94	60	3.98	10	1.26	−100	.10
85	7.08	55	3.55	0	1.00		

[8] This station would be included in the **D** climates, rather than the **C**, only if the limit between them is placed at 32° F., as Koeppen has done in his statement of 1923. Hartshorne, Richard and S. N. Dicken: *Syllabus in Economic Geography*, pp. 7–10. Ann Arbor, Mich.: Edwards Bros., 1937.

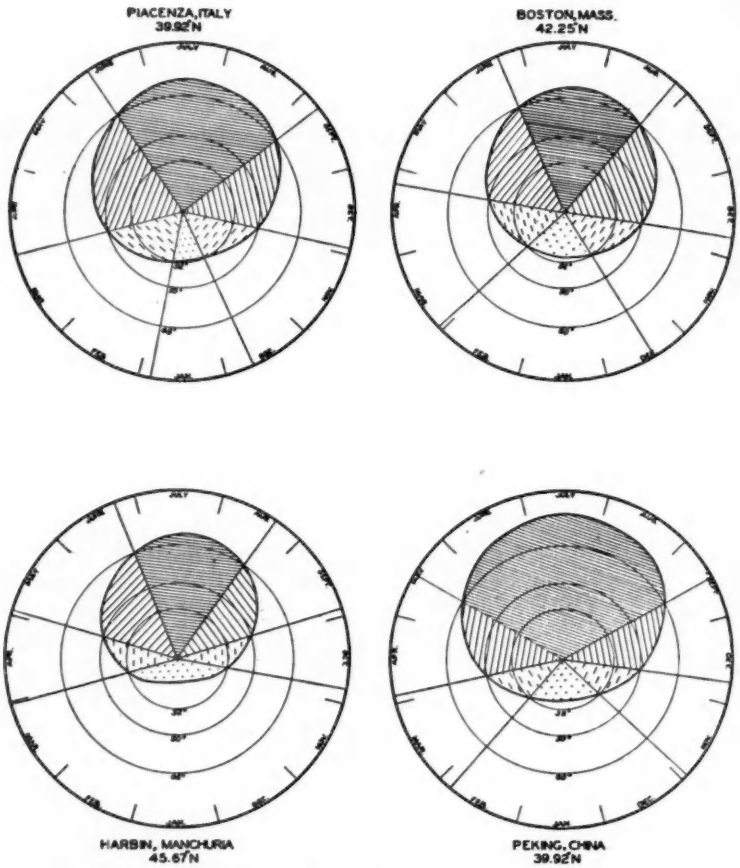


FIG. 3.—Variations in seasonal length of stations in Type 10. Shading from hot to cold, as in Fig. 1. (For the construction of the graphs see footnote 6.)

Whereas the typical Mediterranean station has a four-season cycle in which the seasons are of approximately equal duration, the four-season cycle of northern Europe is strikingly uneven. Berlin for example has a warm summer of nearly half the year. Uppsala, which is certainly not typical in location, has a more even distribution of seasons, with a distinct lag of about a month in their sequence, thanks to the marine influence. Farther into the continent, the major difference is not in the warm summer but in the cold winter, over five months at Moscow. Students of geography are

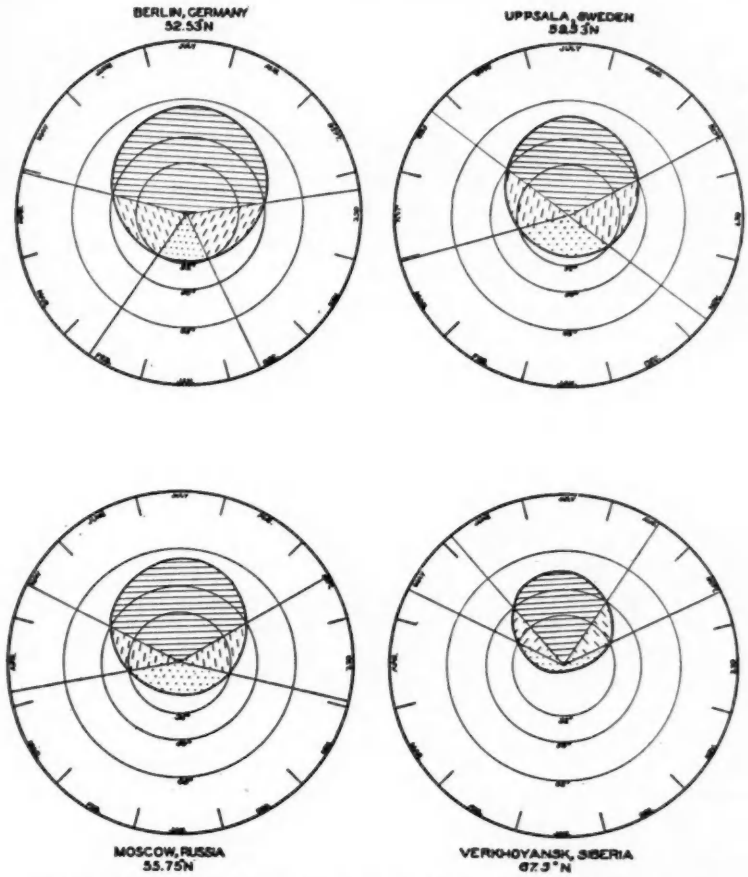


FIG. 4.—Variations in seasonal length of stations in Type 9. Shading from warm to cold, as in Fig. 1.

familiar with Verkhoyansk as a station of extraordinarily great climatic range; more significant are the facts shown directly by the graph—while the cold winter lasts for nearly eight months, there is a warm summer of nearly three months, and the transitional cool seasons are each barely a month long.

Similar graphs, not reproduced here, indicate significant differences within other types of climate. Thus in the Mediterranean climate, the hot summer varies at different stations, from as long as five months, at Athens,

to as short as two-and-a-half at Marseilles; at Los Angeles there is not more than one month of hot summer. Sicily, and the coasts of the Spanish peninsula south of Valencia and Lisbon, have no cool season; consequently but two seasons, a hot summer of about four months and a long warm season the rest of the year. In northwestern Europe (**Cfb**), there are but two seasons, warm and cool. While these are of nearly equal length in northern France and southern England, at Bergen, Norway, the warm season is but four months, the cool season lasting two-thirds of the year. A very striking difference is to be found in the tundra regions. Typically the greater part of the year is cold, with a short cool season, three months on the west coast of Spitzbergen; but on the west coast of Iceland the cool season lasts eight months, only four months is cold winter—about the same length as at Minneapolis, and on the south coast of Chile at least one station has been found that is cool all year, with no cold months (Type 3, Fig. 1).

CONCLUSIONS

In most of the inhabited lands of the world, outside of the tropics, men have always considered seasons in terms of differences in temperatures. A system based on temperature range is therefore a proper standardization of common concepts. Such a standard system, as Professor Jefferson has pointed out, is necessary in order that different parts of the world may be compared with regard to their seasons. That people are so much interested in discussing seasons is a sufficient indication of their importance in human life to justify scientific consideration. No other science has attempted to consider seasons from this point of view. Since the character and length of seasons vary in different parts of the world, and these differences are of great importance in the life of the different regions, and are either directly or indirectly reflected in the appearance of the landscape, the task is appropriate for the geographer to consider.

The layman's concepts of seasons as he experiences them in different regions, when logically examined, appear to involve four degrees of seasons, rather than but three. Where all four are found in the same region, as in northern United States, they form in sequence six divisions of the year, a six-season cycle; other regions may have a four-season cycle, a two-season cycle, or experience one continuous season all year.

No attempt has been made in this study to examine critically the limits chosen for the four degrees or kinds, of seasons; I have merely accepted certain limits in common use. This should not lessen the value of the suggestion if students competent in climatology will undertake to determine the most appropriate limits.

University of Minnesota,
March, 1938.

French Settlement in the Driftless Hill Land*

GLENN T. TREWARTHA

INTRODUCTION

The region here designated as the Driftless Cuestaform Hill Land refers to that part of the inner basin of the Upper Mississippi unmantled by recent till sheets, where the local relief usually exceeds 250 feet. It is not identical with the well known Driftless Area although, in general, that region forms its innermost and roughest part. Relatively inconspicuous deposits of ancient glaciers cover extensive areas in its western and northern parts (Fig. 1). Except in a few sectors its circumference coincides with a belt enclosed between the local-relief isarithms of 200 and 300 feet (Fig. 2). Over considerable areas relief exceeds 500 feet and at a maximum reaches 800. Low hill country and rough plain are the most suitable descriptive terms for the region. Lying as it does in the midst of extensive youthful till plains, the Driftless Cuestaform Hill Land has distinctiveness not only in its degree of local relief but likewise in the patternful arrangement of its stream-eroded relief forms. In all schemes of physiographic subdivisions of the United States the region under consideration stands out as a clearly defined unit.

GENERAL CHARACTER OF FRENCH OCCUPANCE

When in June 1673 Joliet and Marquette with five *voyageurs,* traveling by way of the Fox-Wisconsin portage route, discovered the Upper Mississippi the era of white settlement in the Driftless Hill Land was begun. Up to that time a few thousand Indians following a subsistence economy of planting, hunting, and fishing were the only human inhabitants of that region. Various Sioux tribes, bitter enemies of the Algonquian Indians in central and eastern Wisconsin, inhabited the Mississippi river country north of the Wisconsin river. Trade with the Sioux was the principal attraction for many of the earliest white settlements within the region under discussion.

More than three-quarters of a century of French control over the Driftless Hill Land left an insignificant material impression upon that region. Shorter periods of English and Spanish sovereignty over parts of it were

* The present study dealing with the earliest white settlements in the Driftless Cuestaform Hill Land is the first in a planned series covering the general topic of population and settlements within the region.

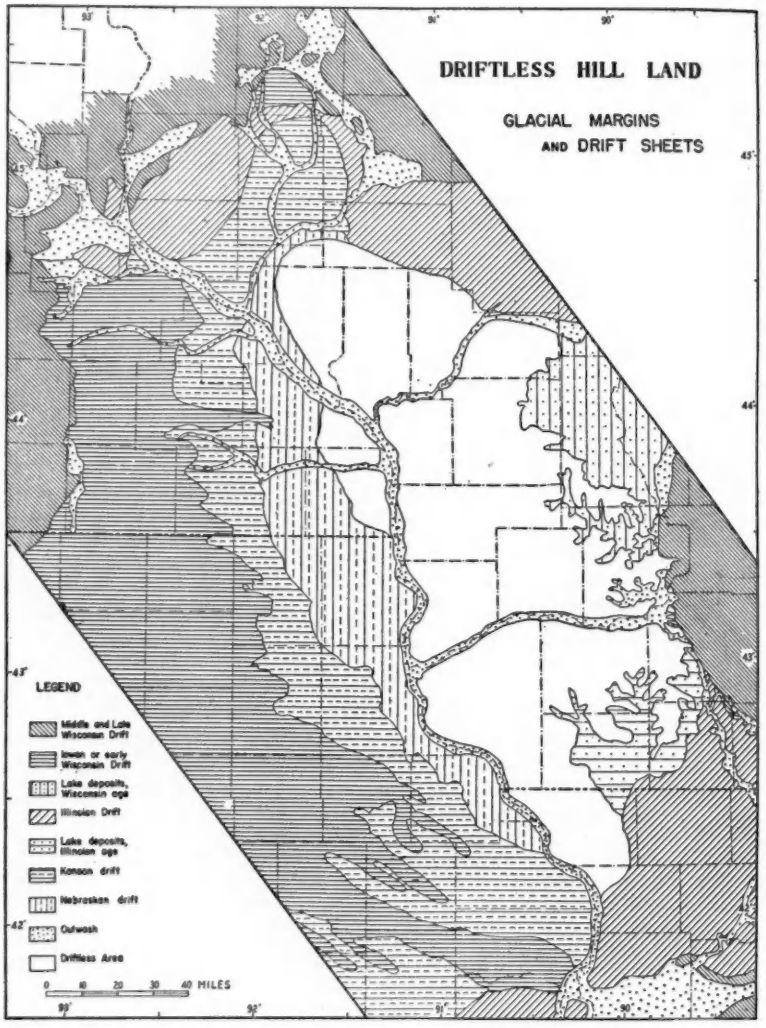


FIG. 1.—The Driftless Area comprises the center and eastern part of the larger Driftless Hill Land here being described. New drift is entirely absent within the latter region although there are considerable areas along its western and northern sides that are mantled by older drifts. Compare with Figs. 2 and 4.

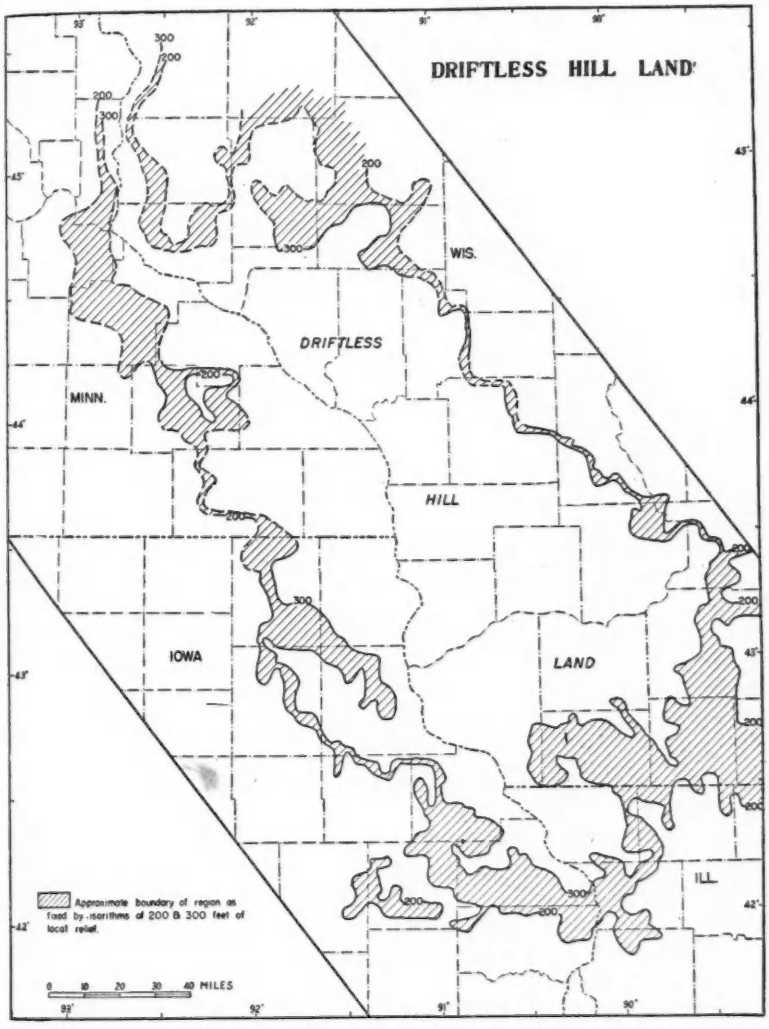


FIG. 2.—The isarithms of 200 to 300 feet of local relief approximately define the boundaries of the Driftless Hill Land. Only in northwestern Wisconsin does relief gradient cease to be the boundary and a young-drift margin take its place. Compare with Fig. 1; likewise with Fig. 4 which includes a precise boundary for the region.

even more barren of results. Furs constituted the dominant incentive luring Frenchmen to the region although in occasional instances missionary zeal, mineral wealth, and ardor to discover and explore new lands were supplementary forces. None of these, however, attracted permanent colonists. The French came as exploiters, not as settlers, and as a result their settlements were temporary and unsubstantial in character. Many of the French, and most of the illiterate French-Canadian fur traders in the Upper Mississippi country are even unknown as to name. They came and went without record, bringing with them French goods from Lower Canada which they exchanged for precious pelts. Serious reduction in the number of fur-bearing animals, and modifications in the Indian methods of living, involving greater dependence upon the white man's goods, were two of the more significant changes induced by these transients in the regions which they traversed.[1] A third and more readily observable feature of French occupance in the Driftless Hill Land was the series of far flung riverside fur trading and military posts. Yet these centers of semi-permanent settlement have so completely disappeared that even many of their sites are not known with certainty. It is with these posts, the most tangible material evidence of sedentary French occupance, that this study deals. Temporary as they were, such establishments are more amenable to representation on maps than are the generally unrecorded number of men, boats, furs and French goods in transit. They were the focal points from which the French mildly influenced the surrounding wilderness.

In general physiognomy the stockaded French fur trading posts of the Driftless Hill Land were probably very similar. This in large measure was determined by the functions they performed and the natural conditions under which they were built. All of them were isolated in a forest wilderness far from sources of supplies and dependent for transport exclusively upon light and fragile canoes that could be carried across portages. In most of the necessities of life the post was compelled to be self sufficient. From the local environment were obtained meat for food, logs for building purposes, wood for fuel, birch bark for constructing canoes, and furs as the chief item of commerce. And while tools were brought from France or Lower Canada, repairing and sharpening was done by the local smith, without whom no fort could exist. The layout of buildings usually consisted of a group of crude log structures, including a somewhat more pretentious one for the commandant, a storehouse for furs, and a smithy—all these enclosed and protected by a stockade of upright pointed logs. The garrison of such a French riverside post ordinarily was composed of an officer in the French

[1] Louise Phelps Kellogg, "The French Régime in Wisconsin and the Northwest," *Vol. I, Wisconsin History Series*, pp. 137–138; State Hist. Soc. of Wisconsin; Madison, 1925.

colonial army, and a score more or less of French and French–Canadian traders and canoemen.

With one exception all of the known French fur trading establishments within the Driftless Hill Land were situated alongside the Mississippi River. This fact of location suggests not only the exclusiveness of river transport, but points as well to the focusing of natural routes upon the main stream. Most of the posts no doubt were within the Mississippi gorge. A majority of them avoided the low and frequently inundated first bottoms and occupied instead the higher terrace fragments within the gorge.

Those French establishments located above the mouth of the Wisconsin had their inception in the lucrative fur trade carried on with the various Sioux tribes which occupied the headwaters of the Mississippi and its tributaries. This region was famous throughout New France as one unusually rich in fur-bearing animals, especially beaver. Easiest among the natural portage routes connecting the Mississippi posts with the Great Lakes and French Canada was that by way of the Fox-Wisconsin rivers and this was the one commonly used (Fig. 3). A portage of only three-quarters of a mile separated the headwaters of the Fox from the elbow of the Wisconsin and when high water prevailed canoes were able to pass from one waterway to the other without unloading. At periods however this preferred route was threatened, or even made quite impassable, by the hostility of the Fox Indians who lived along its course. With good reason they objected to French traders carrying firearms and ammunition to their enemies the Sioux. For this reason a northern and more difficult route by way of Lake Superior and the Brule-St. Croix rivers was occasionally resorted to, as was the one to the south by way of the Illinois.

THE PERIOD 1650 TO 1700

Within less than a decade following Joliet's and Marquette's discovery of the Upper Mississippi, fur trading operations were in progress within the Driftless Cuestaform Hill Land. By 1680 both La Salle and Duluth had trading parties within the region, that of the former arriving by way of the Illinois river, while Duluth used the northern Brule-St. Croix route. Although La Salle's main post lay to the south and outside of the region under consideration, men from his party hunted buffalo near the mouth of the Wisconsin. Duluth, on the other hand, traded in beaver farther up the Mississippi. Jealous of Duluth's trade, La Salle complained when the former moved down the Mississippi and made the return trip with his cargo of furs by way of the Fox-Wisconsin route. In his letter of complaint to Governor Frontenac (1683) he states: "But if they [Duluth's men] go by the Quisconsin when buffaloes are hunted in summer and *where I have be-*

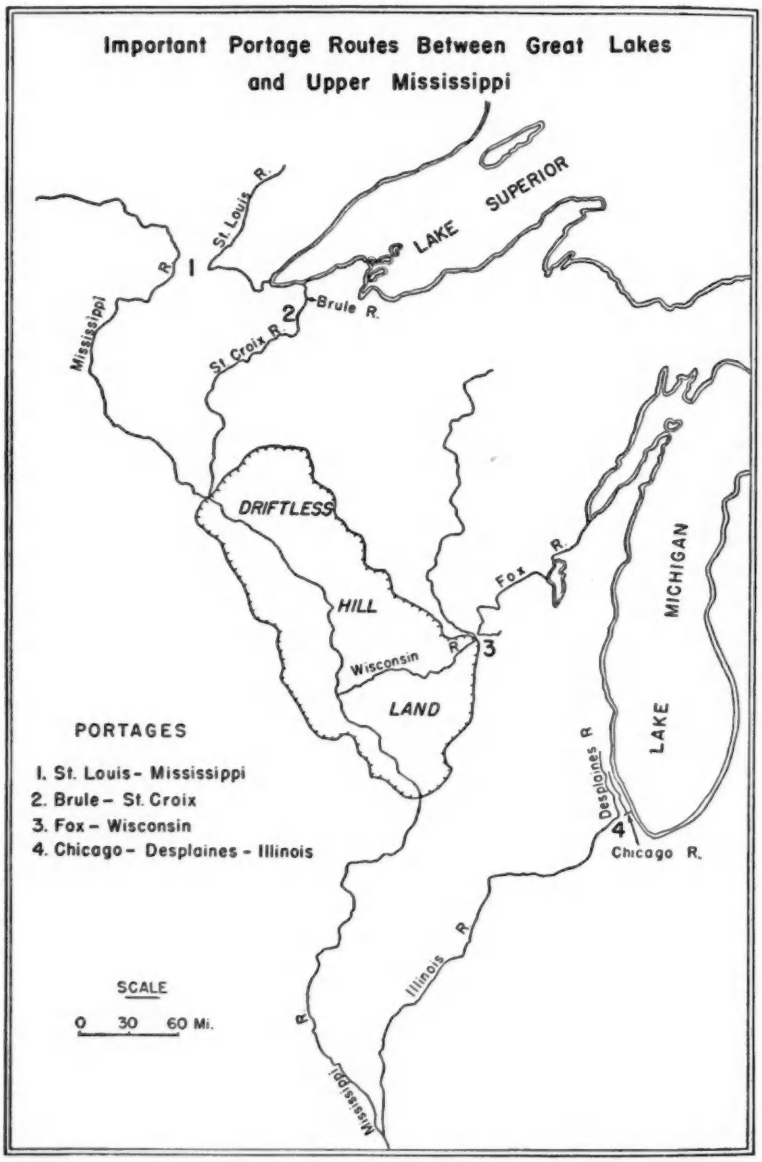

Important Portage Routes Between Great Lakes and Upper Mississippi
LAKE SUPERIOR
St. Louis R.
Mississippi R.
1
2
Brule R.
St. Croix R.
DRIFTLESS
HILL
LAND
Fox R.
3
Wisconsin R.
LAKE MICHIGAN
Desplaines R.
4
Chicago R.
Illinois R.
Mississippi R.
PORTAGES
1. St. Louis - Mississippi
2. Brule - St. Croix
3. Fox - Wisconsin
4. Chicago - Desplaines - Illinois
SCALE
0 30 60 Mi.

FIG. 3.—Of the several portage routes between Great Lakes and Mississippi, the Fox-Wisconsin was the one most used by the French in going to and from the Driftless Hill Land.

gun an establishment they will ruin the trade on which alone I rely, owing to the great number of buffaloes killed every year which is greater than one can believe."[2] Although the evidence is not convincing that a post was actually built by La Salle at the mouth of the Wisconsin, it is possible that he did use it as a stopping place in his fur collecting operations. However that may be, his comment to Frontenac reveals the fact that even at that early date there was a general awareness of the importance of the Fox-Wisconsin link between the Great Lakes and the Mississippi while the Wisconsin-Mississippi confluence was considered so strategic as to warrant the building of a fort at that location.

Within less than two decades following the La Salle-Duluth controversy there is evidence for believing that five French posts were established within the Driftless Cuestaform Hill Land (Fig. 4). All were on the Mississippi. Functionally they were nuclei for fur trading operations. One post, although its principal roots of origin were in the fur trade, may have had mineral exploitation as a supplementary interest. Four out of the five posts owe their establishment to that intrepid French explorer and trader Nicolas Perrot.

Trempealeau Post

In the spring of 1685 Nicolas Perrot was made commandant of the western country with headquarters at Green Bay.[3] This appointment secured for him the large potential trade of the immense and rich Upper Mississippi Valley region. In the autumn of the same year Perrot arrived at his Great Lakes post with a large invoice of trading goods, and after a brief stop at Green Bay left for the Sioux country on the Upper Mississippi traveling by way of the Fox-Wisconsin route. Overtaken by cold and stormy weather while ascending the Mississippi and before reaching the

[2] Pierre Margry, "Decouvertés et etablissements des Français dans l'Amérique septentrionale"; Paris, 1876, II, p. 254. *Wisconsin Historical Collections, XVI,* p. 110; Madison, Wis.

[3] In general, there were two methods of supervising the fur trade—one was the building of posts garrisoned by troops, the Commandant of which was responsible to the Crown through his Governor at Montreal; the other was the granting of government licenses to French traders to carry goods to the upper country. No trading was permitted without a license, although to be sure there was much illegal trading by the so-called *coureurs de bois.* The Commandant of the interior post had full authority over the traders in his vicinity. The legal trade, therefore, was entirely under government control. The Commandant was not supposed to engage in the fur trade, but the temptation was often too great and he did profit by it.

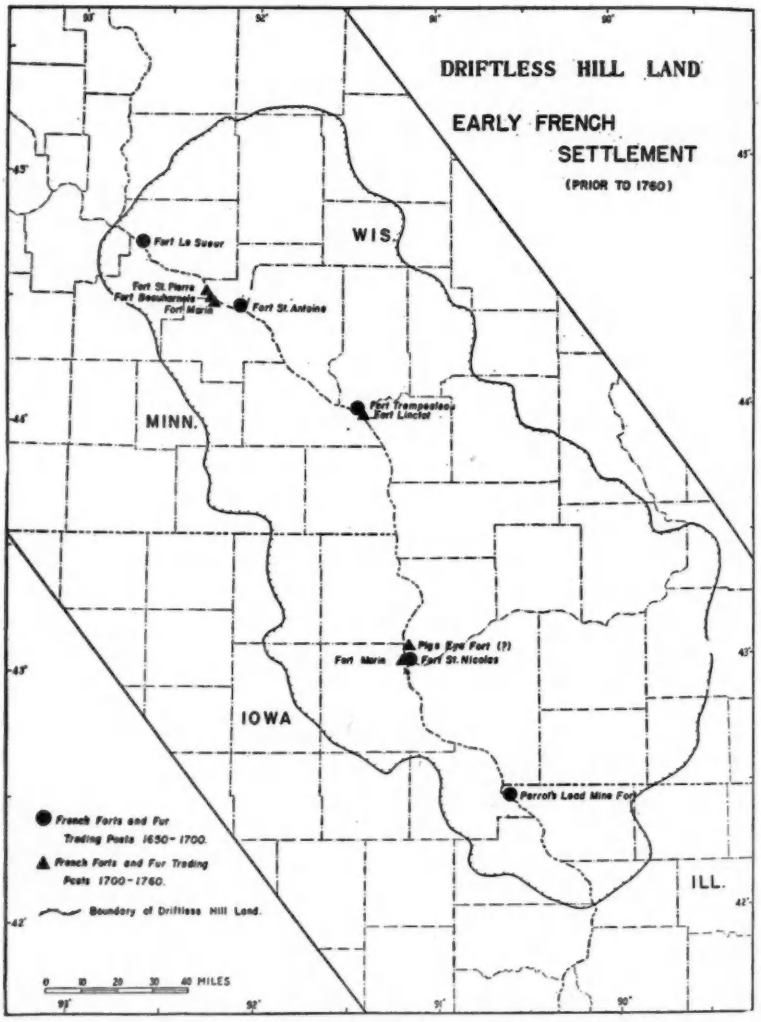


FIG. 4.—Probable situation of the early French Forts.

Sioux lands, the party built a temporary wintering establishment. La Potherie, a contemporary historian, makes the following geographically significant comment concerning the establishment of what was probably the

first post on the upper river:— " . . . the French ascended the river in canoes, toward the west; the latter found a place where there was timber which served them for building a fort and they took up their quarters at the foot of a mountain, behind which was a great prairie abounding in wild beasts."[4] At least three kinds of evidence point to one specific location for this earliest of Perrot's posts, namely at the foot of Trempealeau Bluffs on the Wisconsin side of the Mississippi about 15 miles above La Crosse (Fig. 5). The first of these is that La Potherie's description of

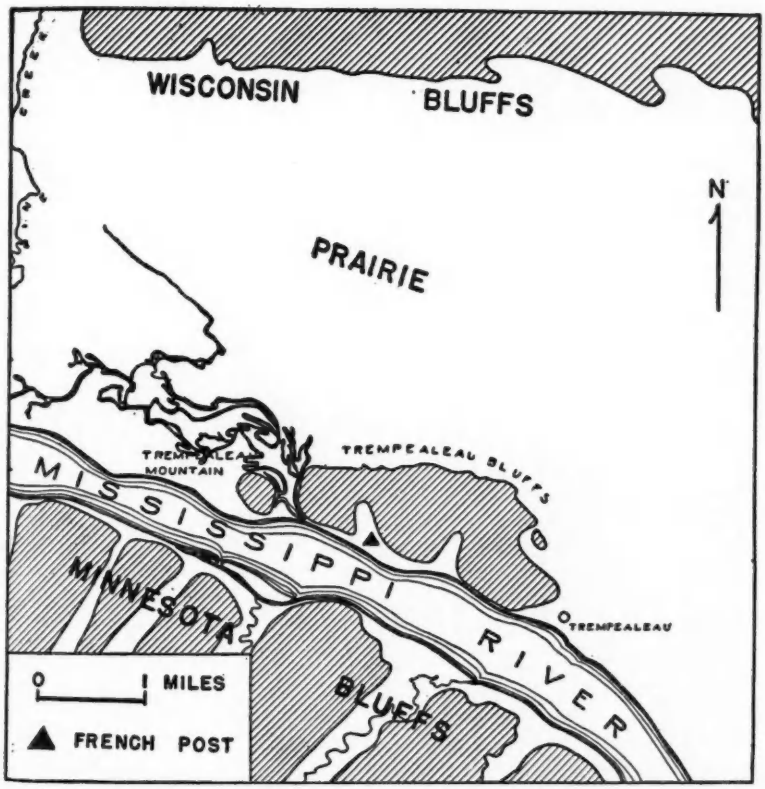


FIG. 5.—The site of Perrot's and Linctot's forts at Trempealeau. Trempealeau Mountain and Bluff reach maximum elevations of 1020 and 1160 feet, respectively. Modified from Lawrence Martin's *Physical Geography of Wisconsin*, p. 149. (Madison, Wis., 1932).

[4] Bacqueville de la Potherie, Histoire de l'Amérique septentrionale; Paris, 1753. Translated in E. H. Blair, *Indian Tribes of the Upper Mississippi Valley and the Region of the Great Lakes*, I, p. 367; Cleveland, 1911.

the site, suggesting a relatively conspicuous and probably isolated eminence near the river backed by a prairie, not only fits the Trempealeau region, but what is more, that is the only place on the Upper Mississippi where that particular combination is found. In this locality the Mississippi occupies a narrow post-glacial trench scarcely a mile wide which separates an isolated fragment of hill, rising 530 feet above the flood plain, from the Minnesota Upland to which it actually belongs. The hill was detached from the main upland by tributaries of the Mississippi when the latter was flowing in the main trench north of Trempealeau Bluffs. Heavily laden glacial waters raised the level of the main channel resulting in the river shifting southward into the much narrower trench carved by its tributaries. The higher and abandoned main channel is now a conspicuous flattish terrace with relatively abrupt margins which stretches for 3½ miles between the river and Trempealeau Bluffs on the south and the Wisconsin upland on the north. Originally covered with prairie grasses, parts of this terrace are still designated by such names as West Prairie, South Prairie, etc. So conspicuous and attractive a landmark is the 500-foot butte that it was known by name to the Indians and the French. By the Dakota Indians it was designated as *Min-nay-chon-ka-ha* or "bluff in the water," and by the Sioux as *Pay-hah-dah* "a mountain separated by water." The French called it *La Montagne qui trempe à l'eau,* or "the hill which soaks in the water." From the last four words in the French title the present name is derived.

The second evidence as to the site of Perrot's wintering place is Franquelin's famous map of Louisiana published 1688. Franquelin, royal hydrographer and engineer of repute, made a trip to New France in 1687 and since Perrot was in Quebec in the Autumn of 1687 there is good reason to believe that he furnished the map maker with original data concerning the locations of his posts. On the map of 1688 just above the mouth of the Rivière Noire (Black River today) there is the notation, "La Butte d' Hyvernement" (the hill of the wintering place) which most likely referred to Perrot's temporary first post.

The third kind evidence is archeological in nature. Sometime in the early 1880's workmen engaged in grading the Burlington railway at the base of Trempealeau Bluffs about two miles above the village of Trempealeau, unearthed evidences of what appeared to be ancient fireplaces. Careful excavation by interested historians and archeologists resulted not only in verifying the identity of one larger and five less pretentious fireplaces, but also in tracing the foundation outlines of a building whose dimensions were about 20 by 30 feet. In addition there were uncovered a blacksmith's forge together with some scrap iron, a pile of charcoal, a heap of slag some 15 feet in diameter, consisting of a mixture of iron ore and limestone, hand

wrought nails, buffalo bones, an old fashioned flintlock pistol, a gun barrel, and an auger. An ax of the period was recovered from a shallow pond three miles distant. Evidences of seven buildings were unearthed in all. Two distinct periods of occupancy were evident, the earlier of which was probably that of Perrot, and the later that of Linctot (*infra* p. 197). The only portion of the ruins that can with some certainty be ascribed to Perrot's post was the lower of two hearths occupying the same site, this earlier one being more crudely constructed.[5] If there were other remains of the earlier fort they were so mingled with those of the later one as to be indistinguishable.

The site of Perrot's Trempealeau post was well selected for wintering quarters. It was on a slough off the main channel where the waters were quiet and free from the menace of floating ice. Springs existed a quarter of a mile away and there was a plentiful supply of wood. The prairie to the rear, according to La Potherie, abounded in wild game while the bluffs gave some protection from northerly winds.

There appears to be no record concerning the size of Perrot's party or the number of canoes which transported them. Like most other such expeditions, however, it probably numbered about a score of men. Definite evidence is likewise lacking as to when Perrot and his party abandoned the Trempealeau post, but since their goal was the Sioux country farther up river, it is assumed that the fort was only a temporary wintering post and was abandoned the following spring. Whether it was ever used again is not known.

Fort St. Antoine

Fort St. Antoine (Fig. 4), on the east shore of Lake Pepin above the mouth of the Chippewa, and Fort St. Nicolas near the mouth of the Wisconsin, were both built by Perrot after he abandoned the Trempealeau post. Exactly when they were built and what their specific characteristics were is unknown. Both of them appear however on the Franquelin map of 1688. It is highly probable that Perrot and his party abandoned the Trempealeau post in the Spring of 1686, ascended the river to the Sioux country and established St. Antoine. On the Franquelin map of 1688 this post is located on the east bank of the Mississippi just *below* the mouth of Lake Pepin and between it and the mouth of the Chippewa. Bellin too in his "Remarks" on his map of 1755 mentions a small fort at the *entrance* of Lake Pepin. But in this vicinity and for two miles above the mouth of the lake on its eastern side the land is very swampy and seemingly quite unsuited

[5] Remains of a French post near Trempealeau. "I Archeological Sketch": by Eben D. Pierce; "II Additional Archeological Details": by George H. Squier, in *Wis. Hist. Proc., 1915,* pp. 111–117.

as the site for a trading post. Since on the Franquelin map the shape of the lake is rather grotesque and out of proportion it is entirely possible that the mark for St. Antoine is not located with great accuracy. Most historians seem to agree that the Franquelin map shows general rather than specific location. A more likely location would be on the east shore of Lake Pepin a few miles *above* its outlet, where the terrace known as Pepin Prairie, rising 40–50 feet above the bottom lands, reaches the lake margin, or slightly farther north where the bluffs come close to the lake. Substantiating this idea, Penicaut, a member of Le Sueur's expedition of 1700, mentions being able to see the remains of Perrot's post on the *eastern shore* of Lake Pepin. On their northward journey through the lake he writes; "To the right and left of its shores are also prairies; in that on the right, on the Lake Shore there is a fort which was built by Nicolas Perrot. It still today bears his name."[6]

Surveyors as well as old residents of the region agree that they had never heard of any traditions of an old fort in or near the locality of Pepin village on the terrace and that no remains of embankments or ditches had been found there. However, as Mr. A. W. Miller, land surveyor of Pepin County, pointed out, had there been any such remains the drifting sand of the terrace would undoubtedly have buried them all. Mr. Miller and other residents of the area stated, however, that at about the middle of last century there were some vestiges of what might have been a French post on the east side of Lake Pepin about 7 (Miller says 6, but his map indicates nearer 7) miles above its outlet. This would locate it (Fig. 6) about 70 feet back from the line of highest water on the lake shore, and 10 to 14 feet above high water in Sec. 20, T. 23, n of Range 15 w, 30 or 40 rods above the mouth of Bogus Creek on a generally timbered region, and some two miles below the village of Stockholm.[7] The nearly rectangular lines or embankments of some previous establishment were at that time quite distinct, rising one or two feet above the general surrounding surface. There was also a slight depression nearly circular in outline in the ground at the southeast angle which may have been the site of the well. There was a tradition among the old Indians and halfbreeds of the region, according to Miller, that many years previously the French people came and built a great tepee (house) and dug a well in it there. Excavations on the site yielded only charcoal and ashes at about 2 to 3 feet below the surface in which were ancient wrought iron nails. Miller had never measured the lines of the foundation but he estimated their dimensions to be about 45×60 feet.

How long Fort St. Antoine was used and what its duration and fate were is not known. Abandonment may have occurred when Perrot quit

[6] *Wis. Hist. Coll., X*, pp. 299–300; footnote 3, p. 299.
[7] *Ibid.*, pp. 368–371.

the upper Mississippi country in 1692, although the buildings of the post were still standing in 1700 when Le Sueur's party made its way through Lake Pepin.[8] The size of the garrison too is somewhat uncertain although from one passage in La Potherie it seems likely that there were 15 men in addition to the commandant.[9] That trading operations at this first Sioux fort were exceedingly good there is good evidence. Leaving a small garrison at St. Antoine Perrot and some of his party returned to Green Bay with the accumulated furs in 1687, storing them in the Mission there while they went on to Mackinac. In Perrot's absence the Mission was burned and with it the stored beaver pelts, the loss amounting to 40,000 livres.[10] Perrot returned to St. Antoine in the autumn of 1688 and in the following spring formally took possession of the Sioux country for France, thus annexing the region of the headwaters of the Mississippi, including the Minnesota and St. Croix-river districts.

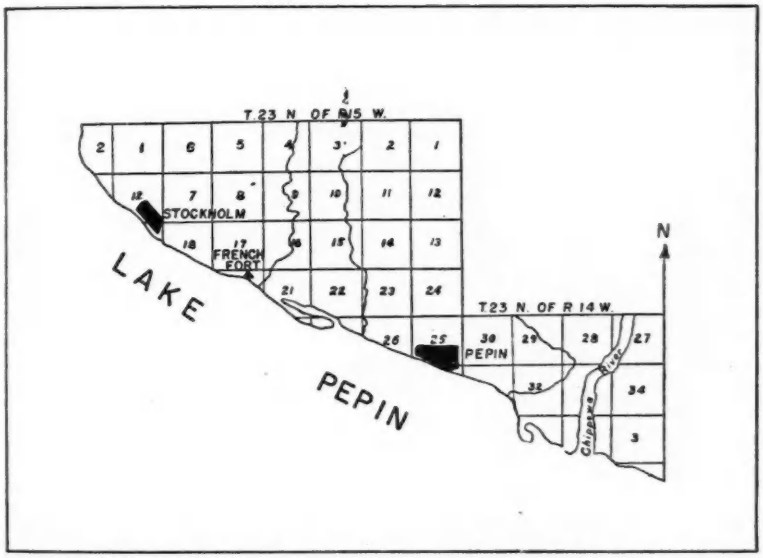


FIG. 6.—Supposed site of a French post which may have been Fort St, Antoine. From a sketch by A. W. Miller, surveyor of Pepin Couny, 1887. First published in Kellogg, "The French Régime in Wisconsin and the Northwest."

[8] Margry, quoted in *Wis. Hist. Coll., X,* pp. 301–302.
[9] La Potherie, quoted in *Blair, II,* p. 19.
[10] *Ibid.,* p. 25.

Fort St. Nicolas

Fort St. Nicolas (Figs. 3 and 4), a contemporary of St. Antoine's, was located farther down river at the strategic point of confluence with the Wisconsin. On the Franquelin map of 1688 the mark for the fort is placed just above the mouth of the Wisconsin on the eastern side of the Mississippi. Both D'Anville's and Bellin's maps of 1755, Bellin's *Atlas* of 1764, Coven's and Mortier's *Amsterdam Atlas* of 1757, and the *Atlas Moderne,* Paris, 1762, all similarly locate Fort St. Nicolas. In all probability therefore it was somewhere on the Prairie du Chien terrace, a bench of older alluvium sufficiently elevated to protect against flooding.[11] That St. Nicolas continued as an occupied post until at least 1689 is relatively certain for in that year Perrot speaks of Boisguillot "as commanding the French in the neighborhood of the Wisconsin, on the Mississippi."[12] This is the last that is heard of Fort St. Nicolas. Penicaut makes no mention of seing it when, as a member of Le Sueur's party, he ascended the river in 1700, although as previously stated he does relate observing St. Antoine.

Perrot's fort at the lead mines

According to La Potherie, Perrot is to be credited with establishing still another post, this one located somewhere *below* the mouth of the Wisconsin (Fig. 4). In 1690 a group of Miami Indians living on the Mississippi 60 miles south of the Wisconsin junction came to Perrot begging him to establish a post in their vicinity "so that they could trade with him for their peltries." To entice him a chief presented him with a piece of lead which he said came from very rich mines situated along a stream which emptied into the Mississippi. The chief would reveal the location of the mines to his white friend providing the latter would build a trading post in the vicinity. Perrot pretended not to be interested, although secretly he was much elated at the possibility of the mining venture, and after further coaxing promised to build a fort. According to La Potherie it was located "below the Quiskonche [Wisconsin] in a place very advantageously situated for security from attacks by neighboring tribes."[13] The exact site remains unknown but La Potherie speaks of the post as being located *below* the Wisconsin and *opposite* the lead mines.[14] Most authorities are of the opinion that the lodes being worked at that time probably were along Catfish Creek about two miles below present Dubuque, where the ore was found in vertical crevices. La Potherie states that the ore was difficult to secure for "the

[11] Glenn T. Trewartha, "The Prairie du Chien Terrace," *Annals Asso. Amer. Geographers, XXII* (1932), map on p. 134.

[12] *Wis. Hist. Coll., X,* pp. 300, 323–330 (quotation from p. 330).

[13] *Blair, II,* pp. 59, 66. *Wis. Hist. Coll., X,* pp. 330–333; *XVI,* 151.

[14] *La Potherie, II,* p. 310. *Blair, II,* pp. 59, 66, 74. *Wis. Hist. Coll., X,* pp. 330–333.

mine lies between two masses of rock," *i.e.,* in crevices. From this same historian's account it would seem likely that Perrot's trading post was on the opposite side of the river from the Dubuque lead mines on about the site of present day East Dubuque or a little below. If, as some believe, La Potherie's reference is to the Galena (Illinois) mines instead of those along Catfish Creek, the fort must have been located across the river on the Iowa bluffs. Since Perrot left the Mississippi country permanently in 1692 his establishment near the lead mines probably was of short duration. But in the short time he was there it is believed he may have taught the Indians crude mining methods for he mentions showing them how to cut the ore away from the rocks.[15]

From Perrot's time on, during French dominance, Perrot's mines, as they were called, were worked more or less constantly by Indians and by white *voyageurs* who used the lead to supplement the fur trade. Penicaut in the journal of his ascent of the Mississippi with Le Sueur in 1700 states "we found both on the right and the left bank the lead mines, called to this day the mines of Nicolas Perrot, the name of the discoverer,"[16] but he makes no mention of the fort.

It bears reemphasizing that establishing the post in question was instigated in part at least by a desire to exploit a resource other than furs. Whether Perrot actually mined and sold lead is not known. The fact that the lead mines of the Dubuque and Galena regions were known to contemporaries as Perrot's mines suggests as much. At any rate the lead region must have impressed Perrot as being a likely place for trade. The constant demand among the Indians for lead with which to manufacture bullets, made the locality an admirable one for a fur trading post.

Fort Le Sueur

Fort Le Sueur (Fig. 4), like those two earlier up-river posts, Trempealeau and St. Antoine, had its origin in the lucrative trade with the Sioux tribes on the Upper Mississippi. Le Sueur was appointed commandant at Chequamegon in 1693 and given instructions to keep open the northern portage route between the Great Lakes and Mississippi by way of the Brule-St. Croix. Although this was a much more difficult route to the Sioux country than was the Fox-Wisconsin, the increasing hostility of the Fox Indians to the French trade in firearms with their enemies the Sioux had caused the latter route to be highly dangerous and at times unpassable. It was urgent therefore that at least one route be left open to the profitable Sioux country and an attempt be made to draw those Indians within the circle of the French alliance.

[15] *Blair, II,* p. 74.
[16] *Wis. Hist. Coll., X,* p. 300.

Sometime in 1694 therefore Le Sueur built a post at the southwestern end of Duluth's old Brule-St. Croix route, locating it on Isle Pelée, now called Prairie Island (Fig. 7), in the middle of the Mississippi bottoms

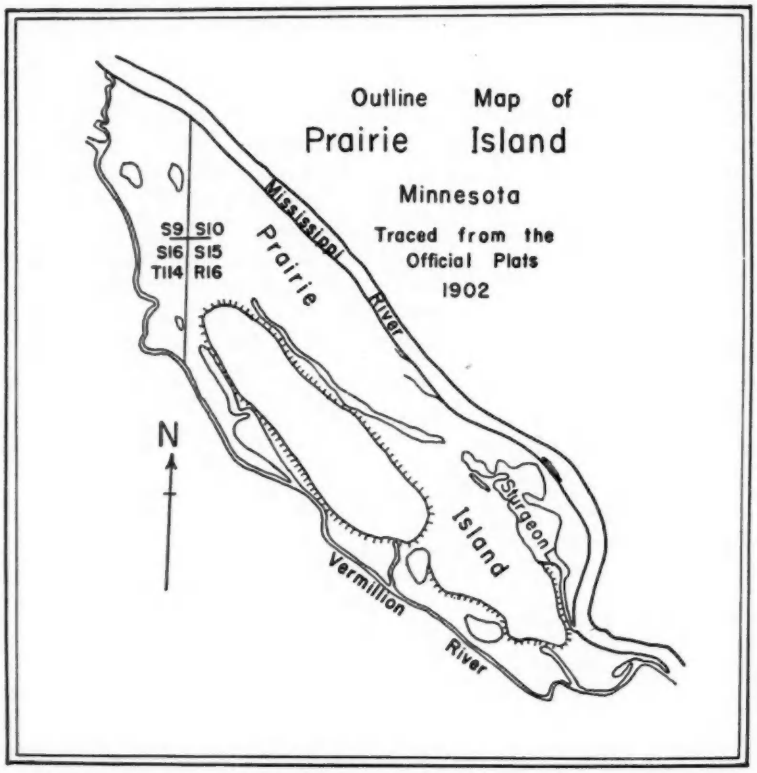


FIG. 7.—Somewhere on this floodplain "island," probably on its higher terrace fragments, was located Fort Le Sueur. After Plate XV in Brower, "Memoirs of Explorations in the Basin of the Mississippi-Minnesota, IV, Discovery of Its Area, 1540–1665."

between Lake Pepin and the mouth of the St. Croix and opposite present-day Diamond Bluff. The higher part of the island is a gravel terrace whose average elevation is about 45 feet above the floodplain surface. Located in the heart of the Sioux country a large sedentary Indian population occupied its surface, four-fifths of which was a natural prairie. Archeological remains in the form of mounds, village sites, an ancient kiln, and an earthwork have been located and charted but no certain evidence concerning the

site of Fort Le Sueur has been brought to light.[17] Although Le Sueur himself did not remain long at the newly established post, it was maintained for several years (four, according to Kellogg) and occupied by French traders as occasion required.[18] The fort was visited again by Le Sueur when he ascended the Mississippi from its mouth in 1700[19] but there is no evidence that he made further personal use of it.

During the last decade of the seventeenth century hostility of the Fox Indians to French trade with the Sioux by way of the Fox-Wisconsin route, wars with the Iroquois along the St. Lawrence, and King William's War between France and England, made difficult the maintaining of French posts in the Upper Great Lakes and Upper Mississippi Valley country. Finally in May 1696 the king of France issued a royal ordinance prohibiting the carrying of trading goods to the western country, and revoking all licenses for fur trading. The king's decision was urged from two different sources, the fur merchants and the Jesuits. Furs in such quantities had reached France from the New World that there were enough beaver skins on hand to last a decade and the prices were consequently low. The remedy applied proposed to raise the prices of pelts by stopping the supply at its source. Equally potent was the opposition of the Jesuits to Western trade. They saw in it the ruination of the morals of young French traders and the Indians alike. By 1698 the posts were all evacuated, the garrisons were recalled and the upper country, including the Driftless Hill Land was abandoned to the Indians and a few missionaries.

THE PERIOD 1700 TO 1760

It was more than a quarter century after the establishment of Fort L'Huillier on Blue Earth River in south central Minnesota, before another attempt was made by Frenchmen to locate a post on the Upper Mississippi. The king's edict of 1696 compelling evacuation of the western country was

[17] J. V. Brower, *Memoirs of Exploration in the Basin of the Mississippi—Vol. VI—Minnesota, Discovery of its Area, 1540–1665,* frontispiece map, and pp. 34, 112; St. Paul, Minn., 1903. *Minn. Hist. Soc. Coll., X,* Part II, p. 465; St. Paul, 1905.

[18] Kellogg, *op. cit.,* pp. 119–120. Wm. Watts Folwell, *A History of Minnesota, I,* pp. 38–39. Dan Elbert Clark, "Early Forts on the Upper Mississippi," *Proc. Miss. Valley Hist. Asso., IV* (1910–11), pp. 91–101.

[19] Fort L'Huillier was the second of the French Upper Mississippi posts whose establishment was associated, in part at least, with an attempt to exploit what was thought to be a body of ore, in this case copper. The fort was on Blue Earth River just south of present day Mankato, Minnesota. Since Fort L'Huillier lay outside of the region being discussed it is mentioned in footnote rather than in the body of the paper. Established in 1700 by Le Sueur and a party of 30 to 40 men, it was in existence only about a year and a half. (See *Folwell, I,* p. 4. *Wis. Hist. Coll., XVI,* pp. 177–198).

reversed in 1714 and the license system for fur traders was reestablished. Thus one barrier hindering renewed French settlement was removed. It was not until 1726 however that a truce with the Fox Indians again made the Fox-Wisconsin portage route temporarily passable and the Upper Mississippi country relatively safe.

Fort Beauharnois

In June of the next year an expedition set out from Canada to reestablish a post in the strategic and profitable Sioux country on the Upper Mississippi. The party included 16 signers of a contract with the government, representing the First Sioux Trading Company, three military officers, and two priests, together with boatmen and soldiers—probably the largest expedition seen up to that time on the upper river. Multiple motives were represented within the party's personnel. Foremost of these without doubt was the profits to be obtained from trade with the Sioux who occupied one of the proverbially rich fur regions of the continent. It was hoped as well to detach the Sioux from their alliance with the Foxes and regain them as allies of the French. The religious or missionary motive was represented by the two priests, while others, having a strong urge to explore, looked upon the post as a base for an expedition to the western ocean, and one link in the proposed land route across the continent.

Traveling by way of the Fox-Wisconsin rivers the party ascended the Mississippi to Lake Pepin and on its western shore, in Minnesota, established a stockaded post, naming it Beauharnois (Fig. 4). The exact site of the original Fort Beauharnois has not been identified. Folwell[20] locates it on a low point of land about midway up Lake Pepin on its western side, nearly opposite the site of Maiden's Rock and about two miles from the present railroad station of Frontenac, Minnesota. Pike placed it just below Point de Sable. That the fort's site was low in elevation is confirmed by the fact that in the following spring the post was flooded causing considerable discomfort.

The establishment consisted of a stockade 100 feet square made of tree trunks set on end and standing 12 feet high. Two bastions permitted flank fire on two sides. Within the stockade were three log buildings, one of them a chapel, and the other two houses for the commandant and the missionaries. Each of the three was 16 feet wide, one of them 25 feet long, another 30, and the third 38.[21] Outside of the stockade were built houses

[20] *Loc. cit., I,* p. 46.

[21] *Folwell, I.,* p. 46. *Wis. Hist. Coll., X,* pp. 302–303; XVII, pp. 22–28. Louise Phelps Kellogg, "Fort Beauharnois," *Minnesota History,* Vol. 8, No. 3, Sept., 1927, pp. 232–246.

for other members of the party, a shop for the smith and a warehouse for trading goods. Altogether there must have been 30 to 40 people at Beauharnois so that the post represented a considerable settlement.

Renewed hostility of the Fox Indians began to cast a shadow over the new post shortly after its establishment and abandonment of Beauharnois took place sometime in 1729, within a year and a half after its founding. Because of the perilous nature of the Fox-Wisconsin route some of the garrison and traders returned by the Illinois and others by the St. Croix, Brule and Lake Superior route. Looting and burning by the natives were probably the fate of the plant itself for nothing more is heard of it.

Fort Linctot

Following the abandonment of Beauharnois, it was not until 1731 that the Fox Indians were sufficiently subdued to make another Sioux post possible. A second Sioux trading company was formed and in that year under the leadership of René Godefray de Linctot a new post was erected on the Wisconsin side of the river on the site of Perrot's old 1685 wintering place at the foot of Trempealeau Bluffs (Fig. 4). In the party, besides Linctot there were a priest and 22 others.[22] An unusually profitable trade in pelts caused the post to be maintained for a period of about five years in spite of the serious dangers to which it was exposed. At times the men of the garrison were veritable prisoners, caught between the belligerent Sioux and the hostile Foxes and their allies. During the year 1738, however, in spite of Indian troubles, nearly 100,000 good beaver skins valued at 178,000 livres were received at Quebec from Fort Linctot and the posts adjacent to Lake Superior.[23] All of the trade from the Sioux post traveled by way of the Fox-Wisconsin route.

Rarely have any remains of the French posts in the Upper Mississippi Valley been discovered. Linctot is an exception. In the fourth quarter of the last century excavation in the vicinity of Trempealeau Bluffs revealed evidences of what appeared to be two old French establishments of somewhat different age built upon the same site. Remains of the later of these, believed to be Fort Linctot, have been described in an earlier section dealing with Perrot's Trempealeau post.[24] The larger and more pretentious fireplace belonged no doubt to the one building of conspicuous size which housed the officers and perhaps served as a storehouse as well. The five smaller hearths, irregularly spaced, heated the smaller shacks which housed the traders. These fireplaces had no backs or chimneys, a fact which would

[22] *Wis. Hist. Coll., XVII,* pp. 36–38.
[23] *Ibid.,* p. 230.
[24] *Wis. Hist. Soc. Proceedings, 1915,* pp. 111–123.

indicate that the smoke escaped through the roof. In all probability the huts of the traders were no great improvement over Indian tepees.

Unsuccessful Indian wars at about this time caused French prestige to reach its lowest point, and Linctot's position at Trempealeau became so perilous that a relief party of 22 men was sent from Canada in the summer of 1735. Only the protection received from the friendly Sioux had made maintenance of the Trempealeau post possible. St. Pierre and his relief party reached Fort Linctot and the following spring removed the Sioux post about 60 miles farther up river.

Fort St. Pierre

Fort St. Pierre (Fig. 4), as the new Sioux fort is usually designated, was, in all probability, on the shores of Lake Pepin but whether on the east or the west side is a disputed question. Most writers have assumed that St. Pierre rebuilt Fort Beauharnois near Frontenac, Minnesota.[25] Kellogg[26] feels that Jonathan Carver's observations indicate a location on the *east* side of Lake Pepin near the earlier Fort Antoine. A careful rereading of Carver however fails to give me the same impression. Entering Lake Pepin from the south on November 1, 1766, he writes, "Here I observed the ruins of a French factory, where it is said Captain St. Pierre resided, and carried on a very great trade with the Naudowessies, before the reduction of Canada."[27] Nowhere preceding or following this statement does Carver indicate anything more specific regarding the fort's location, nor can the reader gather whether his party pitched camp on the eastern or western shore of the lake.

Due to the increasing hostility of the Sioux Indians, the newly established post on Lake Pepin was maintained only about a year and then only under difficulties. Complete evacuation took place in late May 1737 and the fort was burned.

Other Posts Near the Mouth of the Wisconsin

Since the earliest French exploration in the region of the Upper Mississippi the western terminus of the Fox-Wisconsin portage route had been deemed a strategic location. It is little wonder therefore that a number of French establishments were located within its sphere of influence. As previously noted, La Salle as early as 1680 had planned a fur collecting post in the vicinity of the confluence although evidence is lacking that it

[25] *Wis. Hist. Coll., X,* pp. 303–304; *XVII,* footnote 3, p. 223; *XVIII,* footnotes, pp. 33, 283.

[26] *French Régime,* footnote 53, p. 335.

[27] Jonathan Carver, *Travels Through Interior Parts of North America in the Years 1766, 1767, and 1768,* p. 56; London, 1778.

was actually built. It is known with a great deal of certainty however that Nicolas Perrot established a fur depot near the present site of Prairie du Chien in about 1688. Tradition has it likewise that some of the garrison retreating from abandoned Fort St. Pierre established themselves on the Prairie du Chien terrace just above the confluence in 1737. Lockwood, an early settler at Prairie du Chien, wrote that "about 1737 the French established a trading post here and built a stockade about their buildings to protect them from the Indians."[28] It is possible that this may have been the original nucleus of the Prairie du Chien settlement.

More certain is it that some sort of a French post was established on the Iowa side of the Mississippi near the mouth of the Wisconsin in 1739 or 1740 (Fig. 4). At about that time Beauharnois, Governor of New France, sent Pierre Paul Marin into the west to establish order and some degree of friendliness between the recently hostile tribes in the Fox-French Wars. He was commissioned likewise to urge those tribes that had moved across the Mississippi to return to their former locations in what is now Wisconsin territory. This they refused to do, so in order to pursue his work of tribal pacification Marin, so the legend goes, built a post among the recalcitrant tribes in the new territory west of the river. Bribois, one of the earliest settlers at Prairie du Chien, indicated that Marin's fort was located at the head of McGill's slough on the Iowa bank about one and a half miles below Wyalusing.[29] No vestiges of the post have ever been found and nothing is known of its morphology, the size and composition of its garrison, or the length of time it existed.

Legend has located still another French fort near the mouth of the Wisconsin for about 1755 one of the Marins is supposed to have built a post on the site of the present Prairie du Chien. The Old French Fort or the Pig's-Eye Fort (Fig. 4), as it was variously designated, may well have been confused with one of the earlier ones however. This 1755 post is supposed to have been located on the southwestern margin of Prairie du Chien terrace overlooking Pig's-Eye Slough. Remnants of three or four chimney piles and the trench of the palisade of some French establishment are thought to have been located on Farm Lot 39 and within that block of first ward in Prairie du Chien which is bounded by Front, Water, Lessard, and Paquette streets.[30] The site obviously had advantages for it was on a high bank and the first place after leaving the Wisconsin where a boat could land on the

[28] *Wis. Hist. Coll., II,* p. 114.

[29] *Wis. Hist. Coll., IX,* p. 286; Kellogg French Regéme, *op. cit.,* p. 339.

[30] *Wis. Hist. Coll., IX,* pp. 282–302, 464; *X,* pp. 307–372; *American State Papers, Public Lands, III,* p. 341.

Prairie. There is no way of knowing with which of the possible French posts, if any, these relict forms were associated.

Fort Marin on Lake Pepin

After the treaty of Aix la Chapelle which brought to a close the inter-colonial war between France and England, a post was again established within the strategic and profitable Sioux country on the Upper Mississippi. With Pierre Paul Marin in charge an expedition left for the west in the summer of 1750 traveling by the Fox-Wisconsin route. The new post's location is not certain but it appears to have been on the west side of Lake Pepin near Frontenac, Minnesota (Fig. 4) and not far from the former Fort Beauharnois.[81] Marin's return to the Mississippi country was hailed by the Indians with rejoicing. Trade in beaver skins flourished to an unusual degree, and profits were large, the result being a serious depletion in the number of fur bearing animals. For six years the post was maintained. Abandonment came in 1756 when all outlying garrisons were called in to aid in defending New France against the British.

Fort Marin was the last French post in the Driftless Hill Land. In the fall of 1760 the retreating garrisons from Mackinac and Green Bay, comprising a force of four officers, two cadets, 48 soldiers and 78 militia, was the last French expedition to pass through the Driftless Hill Land and along the famous Fox-Wisconsin waterway. Thus quietly and with none of the pomp that marked their taking possession of the Upper Mississippi lands in 1689 the French withdrew. English and Spanish sovereignty were substituted in the territory to the east and west of the Mississippi respectively. A few French names are still to be found among the citizens of such old river towns as Prairie du Chien but the small French element has largely been merged indistinguishably with the American. More prominent are the French place names which still persist in some numbers among the counties, settlements and rivers of the Driftless Hill Land testifying to over eight decades of French occupance two centuries ago.

University of Wisconsin,
February, 1938.

[81] Folwell, *Minnesota*, I, p. 46. E. D. Neill, in *Macalester College Contributions*, 1st ser., pp. 214–218; St. Paul, Minn., 1890. Kellogg, *French Régime*, pp. 378–380.

Materials Bearing upon the Geography of the Atlantic Seaboard, 1790 to 1810*

RALPH H. BROWN

RECENT VIEWPOINTS IN HISTORICAL GEOGRAPHY

Within the past quarter-century authorities in historical geography have defined their field in terms which are essentially consistent with modern geographic thought. Professor Barrows in 1922 expressed his views thus: "To me, indeed, historical geography has come to mean simply the geography of the past—human ecology in past terms. Historical geography, the geography of the past, helps to show the significance of past geographic conditions in the interpretation of present geographic conditions. It provides the key to many environmental relationships that have persisted after the occasion for them has passed. It introduces, so to speak, the 'third dimension' into geography."[1] Hettner observes in no uncertain terms that "by historical geography one can mean only the geographical study of past times."[2]

Roxby's interpretation, though less forthright than the foregoing, nevertheless shows that the discovery of the essential features of the geography of a unit area at a specified time in the past constitutes a worth-while contribution to this borderline field. According to him, "historical geography is essentially human geography in its evolutionary aspects. . . . It has the same aspects and is permeated by the same concepts as human geography. The primary object is not, as has been too often supposed, to explain historical events as determined by geographical conditions; but on the other hand historical geography is far more than history illustrated by a few maps."[3]

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* Summarizing in part a study made possible by grants-in-aid for 1936 and 1937 from the Social Science Research Council and the University of Minnesota. This paper is intended to be preliminary to a monographic treatment of the geography of the Atlantic Seaboard at the opening of the nineteenth century.

[1] Harlan H. Barrows, "Geography as human ecology," *Annals of the Assoc. of Amer. Geogs.*, Vol. 13 (1923): 11.

[2] A. Hettner, *Die Geographie, ihre Geschichte, ihre Wesen, und ihre Methoden*, Breslau, 1927, p. 150, and a similar statement at an earlier time in *Geographische Zeitschrift*, Vol. 11 (1905): 563–564.

[3] Percy M. Roxby, "The scope and aims of human geography," *British Assoc. for the Advancement of Science, Section E—Geography*, Bristol (1930): 14.

In the editorial preface to a recently published book in this field the Barrows definition is, in effect, repeated when it is stated that in performing this type of investigation the geographer "strictly speaking merely carries [his] studies into the past: his subject matter remains the same."[4]

These and many other recent definitions which might be cited emphasize historical geography as an inquiry into and a coherent presentation of the past geography of definable areas. On occasion this type of study has been called a "reconstruction" of the geography at a particular stage in regional occupance. Thus, Robert B. Hall has suggested that reconstructions be made for the Great Lakes area in the course of which "we should attempt to layer occupance on occupance in much the same manner as a geologist studies stratifications, and each of these occupance layers can be correlated, locality by locality."[5] The study of an antecedent "occupance layer," it may be observed, yields a partially developed cross-sectional view of the regional geography of that period. The preparation of cross sections of various types has long engaged the interest of workers in the social sciences. The taking of a regional cross section at a particular time in the past necessarily involves the interruption of the essentially continuous historic stream. Historians have shown the validity of this by the identification and discussion of "periods" and at least one of them avers that "cross sections of some kind there must be, if we are not to be trapped in a hopeless entanglement of times and places."[6]

In the "sequent occupance" approach to the study of the present landscape, advocated as recently as 1929,[7] the investigator necessarily conforms to the spirit of the recent definitions, but in this case concern is directed chiefly to those aspects of the past which have "left vestiges and so exist also, in effect, in the present." This type of study which has been, and perhaps in its research aspects must be restricted to the analysis of small areas, has emphasized the recognition of "stage of occupance" which has been defined as "an epoch during which human occupation of an area remains constant in its fundamental aspects."[8]

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[4] E. G. R. Taylor, quoted by H. C. Darby in *"An Historical Geography of England before A. D. 1800,"* London, 1936, p. vii.

[5] "Round table on problems in cultural geography," *Annals of the Assoc. of Amer. Geogs.*, Vol. 27 (1937): 168.

[6] Ephraim Emerton, "The periodization of history," *Proc. Mass. Hist. Soc.*, Vol. 52 (1918–19): 57.

[7] Derwent Whittlesey, "Sequent occupance," *Annals of the Assoc. of Amer. Geogs.*, Vol. 19 (1929): 162–165.

[8] Derwent Whittlesey, "Coastland and interior mountain valley," in *New England's Prospect*, Amer. Geog. Soc., N. Y., 1933, footnote, p. 451.

RECENT VIEWPOINTS RARELY DEMONSTRATED IN PUBLISHED STUDIES

Geographers have been slow to accept the challenge which inheres in this acceptable reorientation of the "third dimension" of their field. The list of studies of cisatlantic areas which exemplify, to the satisfaction of geographers and historians, the practical working out of this concept is admittedly unimpressive.

The two factors believed to have been mainly responsible for the dearth of regional studies of the past geography of areas in this country are (1) the actual or assumed want of reliable materials descriptive of early geographical conditions, and (2) the more or less tacit assumption that a study based upon such records as are available necessarily involves a time sequence, thereby greatly complicating the reconstruction with the danger that the end result will be an historical rather than a geographical study.

In contradiction of the second assumption it must be urged that a time sequence is by no means essential in a geographical study of the past. Hettner was perhaps the first to point out that "for geography the time is, in general, a minor matter . . . geography does not follow the sequence in time as such . . . it takes a limited cross section through reality at one particular point of time and utilizes temporal development only in order to explain the conditions at the time chosen."[9]

The first-named factor, therefore, appears to be the more critical one. Reliable descriptive materials and records customarily employed in geographical work are actually wanting for some past periods and are fragmentary for others; on the other hand contemporary records pertaining to the older settled Atlantic margin during certain stages in its occupance are to be had in surprising quantity and variety. Reference is made, of course, to periods antedating the commonly accepted beginnings of professional geography.[10]

Records made by intelligent people who observed, thought and wrote in the manner traditional with geographers are especially abundant for the Atlantic Seaboard, to use a regional term familiar at least by the middle of the eighteenth century.[11] The availability of trustworthy geographical ma-

[9] *Geographische Zeitschrift,* Vol. 11 (1905) : 556. Abstracted translation authenticated by R. Hartshorne.

[10] For a critical discussion of descriptive works which are associated with the advance of professional geography see W. L. G. Joerg, "The geography of North America; a history of its regional exposition." *Geogr. Rev.,* Vol. 26 (1936) : 640-663.

[11] This term identified the land area connected with the ocean by navigation. It was used without definition by Thomas Jefferson while Secretary of State in his: "Report to the Congress of the United States of America on the nature and extent of the privileges and restrictions of the commercial intercourse of the United States

terials relating to the seaboard must be the guide to the selection of the period for which a reconstruction of its past geography is made and must also govern the areal limits within which this may be done with confidence.

INADEQUACY OF GEOGRAPHICAL MATERIALS BEFORE THE 1790's

Certainly a study of the geography of the complex Atlantic seaboard at a past period cannot safely be rested upon a few eye-witness accounts widely separated in time and place, however solidly these might be buttressed with official data and contemporary maps. The recorded observations of individuals, particularly those which were made during the formative stages of settlement, must now be used with caution. Much of this early descriptive literature, as Wroth has pointed out in the instance of Maryland, "was the stuff of dreams and a challenge to the spirit," and until near the 1650's was definitely of a promotional character.[12] The greater part of this curious literature, of which Thomas Glover's "account of Virginia" in 1676 is an excellent example,[13] is more amenable to use and interpretation by a historian than by a geographer, even in those instances when a geographical exposition was attempted. W. M. Davis has called attention to the "innumerable" seventeenth and eighteenth century "records of colonization along the Atlantic seaboard" which give more detail "on the human side than on the physiographic side, and thus have awaited embodiment either in history, where they have been much used, or in geography, where they have been used less,"[14] but fails to warn that many of these records are not to be relied upon. Not all such accounts were deliberate falsifications; often the writer was simply misinformed or was conveying to others what he thought was true. An eminent historian of the colonial period has pointed out the importance of this material, saying that "whatever a given age or people believe to be true is true for that age and people. Whether what they believed was true according to any particular standard or not, or whether from a modern point of view their belief was wise or prudent, has

with foreign nations." This report was added to Alexander Hamilton's "Report on the American Budget for 1794," printed by J. Durett, London, 1794. In the text Jefferson distinguishes between the "landboard" and the "seaboard." John Pickering's "Memoir on the present state of the English language in the United States [etc]" in *Memoirs of the Amer. Acad. of Arts and Sciences*, Vol. 3 (1809–19), contains a contemporary definition of "seaboard" and refers to Jefferson's extraordinary use of "landboard."

[12] Lawrence C. Wroth, "Maryland colonization tracts," in *Herbert Putnam Essays*, N. Y. (1929) : 539, 551.

[13] "An account of Virginia, its scituation, temperature, production, inhabitants [etc.]." Reprint by Horace Hart, Oxford, 31 pp.

[14] "The progress of geography in the United States," *Annals of the Assoc. of Amer. Geogs.*, Vol. 24 (1924) : 196.

nothing to do with the case."[15] But to the geographer seeking to penetrate the veneer of beliefs to get at the facts of the geography of a particular time and place, much more than this must be available before a reconstruction will be ventured.

Even in the later colonial period as well as during and immediately after the Revolution much of the descriptive matter, particularly that broadly classified as "travel literature" retains an element of bias not always apparent to the casual reader. Into the writings of patriotic citizens no less than those of foreign visitors crept prejudicial comment. "We have been from the day of our Independence the victims of deliberate falsehood and romantic fancy," wrote Samuel Breck in a reminiscent letter in 1862. "French descriptions are generally decorated with fairyland pictures and the English with expressions of scorn and hatred," not recognizing his own inconsistency in then giving praise to Brissot de Warville's *New Travels* (1788). Brissot's running commentary is scarcely nearer the truth than the *Concise Account* of the illustrious Robert Rogers (1765), a book written, as Kenneth Roberts has shown in his *Northwest Passage,* under conditions not suited to sober scientific work. The unravelling of the fact from the fancy out of which much of this early literature is composed is always a difficult and often a hopeless task.

Of systematic geographic literature before the 1790's there was practically none which might now serve as a framework for organizing the incidental observations recorded at the same time. Two exceptions to this rule may be briefly noted. Thomas Jefferson first published his *Notes on the State of Virginia* in 1784, after which the book went through many editions, receiving more attention, perhaps from its distinguished authorship, than its ill-organized contents really merited. Lewis Evans, possibly the first individual in this country to be known by contemporaries as a geographer, published his *Geographical Essays* in 1755. This work won frequent high praise from W. M. Davis who wrote in one place that the book "is illustrated by a map which, like the text, bears witness to an extraordinary acuteness of observation, and as well to an unusual power of generalization, on the part of the author who must be regarded as an early leader among American geographers."[16] This essay, largely a treatise in physical geography and most remarkable for its treatment of the Appalachians, remained the standard for over half a century, especially through

[15] Charles M. Andrews, "Virginia's place in colonial history," *Virginia Magazine of Biography and History,* Vol. 40 (1932) : 225.

[16] "Was Lewis Evans or Benjamin Franklin the first to recognize that our northeast storms come from the southwest?" *Proc. Amer. Phil. Soc.,* Vol. 45 (1906) : 129–130.

its reissue and partial revision by Thomas Pownall, a provincial governor of Massachusetts, in 1776. Evans had planned to follow this essay with others which, had they been completed, might have furnished us with an intelligible background for an understanding of the culture during the middle of the eighteenth century. His death at about the age of 56 (uncertain because the date of his birth is not precisely known) prevented the continuation of the series.[17]

Official tabulations of data relevant to geographical study—data of population, manufactures, land uses, commerce and the like—do not exist in quantity until toward the end of the eighteenth century. In contrast with the fragmentary character of the descriptions and the meagerness of the statistical sources is the wealth of the cartographic record over the corresponding period. Naturally there was an improvement in the accuracy of the map record, especially evident in the eastern portion of the continental maps. Following the publication of Lewis Evans' map of the Middle British Colonies in 1755, maps showing the Atlantic coastal area increased so rapidly in number and variety that a mere list of titles would run to considerable length. Such a list could be still further extended by including with the large-area maps those showing separate states, property subdivisions, roads, city and town plans and coastal charts. By the opening of the nineteenth century, cartographic resources become more than adequate.

GEOGRAPHIC MATERIALS—1790 TO 1810

The quest for the earliest period for which an authentic regional historical geography of the seaboard area may be prepared reaches a satisfactory stopping point at the opening of the nineteenth century. The year 1800 roughly marks the mid-point of a twenty-year period remarkable for the content and coverage of contemporary geographical material. This material, to be found mainly in books, periodicals and the journals of learned societies, extends to thousands of pages amplified by many maps of great variety—tangible evidence of a widespread interest in things geographical. Few of those who prepared this material claimed to be geographers. Their number includes several "natural scientists" some of whom, as did Benjamin S. Barton and Samuel Williams, held university professorships. In addition there were many men in public life, statesmen like Albert Gallatin and James Madison, who were interested in geographical problems and wrote convincingly regarding them, and appointees to official or semi-official positions whose work, possibly as land surveyors or Indian agents, gave them intimate or specialized knowledge of conditions as they

[17] For a critical appraisal of the work of Lewis Evans see: Lawrence C. Wroth, *An American Bookshelf, 1755*, Univ. of Penn. Press, Phila., 1934.

were and who had a flair for geographical description. The ranks of observers and writers between 1790 and 1810 were swelled by a large group of individuals difficult to classify: clergymen, physicians, foreign visitors and members of the intelligentsia, who informed themselves upon topics usually cognized in a regional study and who felt impelled or possessed the means to make a record of this knowledge. By avocation some of these were geographers or became so for the time being. For the most part they wrote geography without being aware of it—sometimes indeed disclaimed any intention of it—and issued their work under titles which give slight clue to their contents. On rare occasions only did the authors use the word "geography" to identify their work; when they did so it was often with a practical eye to the greater salability of the volume.

This eye-witness material which was recorded but not necessarily pub-

BENJAMIN SMITH BARTON

lished during the twenty-year period indicated constitutes the essential framework for a contemporary regional cross section of the seaboard area. The time limits within which observations have been accepted have been drawn precisely but not arbitrarily. Subsequent to the first decade of the nineteenth century there is a noticeable reduction in the quality of the geographical material, owing in part to the upheaval attending the second war with Britain, in part to dissipation in geographical work consequent upon the territorial expansion of the nation, and in part also to the loss by death or by diversion of interest to other endeavors of those who had contributed to geographical work during the preceding years. Furthermore, it would be inconsistent to extend the period much beyond 1810, since the desire is to gain an essentially contemporaneous view of a particular area at a stated time. It is true that between 1790 and 1810 many changes occurred—McMaster has observed that it was a period "fruitful of all manner of projects for internal improvement"[18]—and thus two accounts of the same scene might differ because an actual change had occurred; but the allowed time interval appears sufficiently restricted to ensure a reasonable degree of comparability.

GEOGRAPHICAL MATERIALS CLASSIFIED

The materials available are classifiable into two broad groups conveniently designated as (a) works of organization and (b) sporadic observations. The former group includes literary efforts of larger scope—larger in respect to areal coverage and range of factual content. In their composition the author attempted to collect, by means of interview and study of published and manuscript records, official data and maps, such material as seemed relevant to a geographical exposition, combining with it the results of his own observation and thought. These literary efforts are, therefore, comparable with our modern text books, especially those which have regional coverage. Characteristically of geographers, perhaps, the authors were not always particular in indicating to the reader which parts of his treatise represented his own work and which that of others. One of the many duties incumbent upon the present-day user of this material is to distinguish between the two. It was quite customary, for example, for writers during this period to borrow without credit from Jefferson's easily accessible *Notes on Virginia* (1784) statements relating to agricultural conditions which were no longer true twenty years later. Even the most ambitious and studious organizer during this period could not possibly have had access to all or even a major part of the available information of the

[18] John B. McMaster: *A History of the People of the United States,* N. Y. (1885): Vol. 2, p. 74.

time. There were no great public libraries; even the private library of the wealthy Washington, well known for his geographical interests, contains but few relevant items.[19] Many of the books issued at this time were in small editions, rare within a few years of their publication. A considerable part of the material remained unpublished for many years; indeed some of it is still in manuscript in libraries, institutions and private collections. Significant examples of sources inaccessible at the time but covering the period are the *Statistical Annals* of Adam Seybert published in 1818 but founded on public documents commencing in 1789, various state papers,[20] some journals of official appointees,[21] and recently published accounts of Spanish East Florida.[22] A second duty of the present-day student, therefore, is the discovery of this contemporary material which was unavailable to or overlooked by the organizers, and the utilization of those parts which contribute to an understanding of the geography of that time. Ordinarily, too, the material which the organizers did use requires re-working and re-orientation to bring it into line with present-day standards of scholarship.

Sporadic observations include (a) records of travelers, (b) articles in the journals of learned societies, and (c) contemporary writings in magazines, newspapers and pamphlets. Travel records, usually rendered in the form of a diary in which geographical data are embedded in an ill-assorted miscellany of irrelevant observations, by no means occupy as strategic a place in such a study as one would gather from reference to secondary historical literature in which they have been largely used. Articles in scientific journals, especially when written by authors of the larger works, have particular value. That portion of the writings in popular magazines, weekly newspapers and pamphlets which bears upon contemporary geographical problems runs to enormous proportions. Here people were wont to publish commentaries on agriculture and other industries, soil erosion, the condition of the forest; and to insert tables of weather data and the dates of flowering and fruiting of plants. In such places one finds news items regarding the building of this or that canal, the opening of a turnpike, and the numbers of vessels cleared at certain ports together with their cargoes. This fragmentary or "fugitive" information, by itself of little significance and border-

[19] The greater part of this library is preserved in the Boston Athenaeum.

[20] For example, Albert Gallatin's account of fish and whale products and Thomas Jefferson's report on a similar topic, comprising *State Papers 71 and 5, Class 4, Commerce and Navigation*, Washington, 1832.

[21] For example, Benjamin Hawkins: "A sketch of the Creek Country in the years 1798 and 1799; *Coll. of the Georgia Hist. Soc.*, Vol. 3, Part 1, 1848. His MS of this with a criticism is in the library of the American Philosophical Society.

[22] Arthur P. Whitaker, Trans. and ed., *Documents Relating to the Commercial Policy of Spain in the Floridas, with incidental reference to Louisiana:* Florida State Hist. Soc., Deland, 1931.

ing closely upon distinctly historical materials, becomes of geographical value only when collated with all the rest in a balanced treatment. The third duty of the present-day geographer, therefore, is that of filling out the record with such of these details as is compatible with the objects of the whole study.

THE SIGNIFICANCE OF THE WORKS OF ORGANIZATION

Both major classes of materials are essential to a reconstruction of the geography of the seaboard area at the opening of the nineteenth century. The works of organization are critical for three reasons.

First, they suggest and in part precisely outline the limits of regions which had recognizable character at the time. The welcome result is that the investigator need not resort to an artificial selection of regional boundaries within which to localize his study, or slavishly accept those which have no better basis than a firm rooting in tradition or which are valid only in terms of the present time.

Second, they provide a means by which we may estimate the reliability of observations upon features, especially cultural features, which exist today only in modified form or have vanished altogether. (a) In a work which covers a range of topics, the author reveals his standards of scholarship in his treatment of aspects such as climate upon which we have a direct check. If the author shows diligence and resourcefulness in the acquisition of basic climatic data and demonstrates intelligence in their handling with a reasonable command of the subject matter, we are inclined to accept his other observations with greater confidence. (b) Moreover, these works set up a standard of achievement by which we may appraise the reliability of the sporadic records, many of which were made by individuals upon whose ability to observe geographical phenomena there is no direct evidence. The question in such a case is: Is the observation consistent with that of others whose integrity has been demonstrated? (c) Again, these works were considered important enough to draw published criticism in the review sections of the periodical literature. The nature of the review, at that time usually a full one indeed, gives additional clues to the acceptability of the work, at least in the opinion of well-informed contemporaries. The review takes on added significance when written by an individual known to have been conversant with the subject-matter.

Third, these works indicate to the investigator the sorts of regional problems which need elaboration and suggest effective lines of research.

For one or all of these reasons, parts, and often very small parts, of the following have been found critical.

Group A: Regional or quasi-regional works

C. F. Volney: *Tableau du Climat et du Sol des États Unis d'Amérique,*

Courcier et Dentu, Paris, 1803; two parts in one volume, 532 pages. This also forms Vol. 4 of *Oeuvres de C. F. Volney,* Parmentier, Paris, 1825. There are two English translations: *View of the Climate and Soil of the United States of America,* translator unknown, London, 1804, and *A View of the Soil and Climate* [etc.], translated by Charles B. Brown, Philadelphia, 1804.

John Drayton: *A View of South Carolina as Respects Her Natural and Civil Concerns,* W. P. Young, Charleston, 1802, 252 pages. Translated into German as: *Beschreibung von Sud-Carolina,* Vol. 35 of Bibliotek der Neuen Reisebeschreibung, Weimar, 1808. The MS. of the English edition with a preface written in 1821 is deposited in the Charleston Library Society.

Samuel Williams: *The Natural and Civil History of Vermont,* Thomas and Carlisle, Walpole, N. H., 1794.

Benjamin S. Barton: *Fragments of the Natural History of Pennsylvania,* Way and Groff, Philadelphia, 1799.

Samuel L. Mitchill: "A sketch of the mineralogical history of New York," *The Medical Repository,* various numbers: 1797, 1800, 1802.

Joseph Bouchette: *A Topographical Description of Lower Canada, with Remarks upon Upper Canada and on the Relative Connexion of Both Provinces with the United States of America,* London, 1815, 640 pages and appendix.

Group B: Compendiums

Christoph D. Ebeling: *Erdbeschreibung und Geschichte die Vereinten* (sic.) *Staaten von Nordamerika,* 7 volumes of 6500 pages, published intermittently at Hamburg by Carl Bohn from 1793 to 1816. Title varies.

Joseph Scott: *The United States Gazetteer, Containing an Authentic Description of the Several States of the United States. . . .* Philadelphia, 1795.

W. Winterbotham: *A View of the United States of America and the West Indies,* New York, 1796, 4 volumes. Title varies.

Jedidiah Morse: *The American Geography, or a View of the Present Situation of the United States of America,* Elizabethtown, N. J., 1789 and later revised editions. Title varies.

B. Davies: *A Sketch of the Geography and Present State of the United Territories of North America* [etc.], Philadelphia, 1805.

Tench Coxe: *A View of the United States of America in a series of papers written . . . between the years 1787 and 1794,* Philadelphia, 1794.

THE UTILITY OF THE REGIONAL WORKS ILLUSTRATED BY VOLNEY'S *Tableau* AND DRAYTON'S *View*

The opening chapters of Volney's *Tableau* and Drayton's *View* are significant for all the reasons mentioned and thus will serve to illustrate the utilization of the offerings in this group.

In both treatments a regional portrayal was attempted and brought to partial completion; each records or rather compresses into a small space the

results of much preliminary work—a fact not apparent to the casual reader; and the issuance of both volumes aroused an unusual amount of discussion and criticism. The chief point to be established here in brief compass is that some of the conclusions of these observers may be relied upon, especially in the parts where such conclusions were generalized into a regional scheme. To the extent to which generalization followed a mature consideration of the basic data, the identified regions provide a valid starting point for a reconstructional study.

During his three years of preparatory work in this country between 1795 and 1798, Volney himself was the subject of much comment: his

CONSTANTIN FRANÇOIS CHASSEBOEUF VOLNEY

arrival raised hopes that at long last there had appeared on the scene a man capable of preparing a reliable "picture" of eastern United States. A Charleston news-magazine announcing the arrival of "the celebrated Mr.

Volney" in New York City on his way to Philadelphia, prophesied optimistically that "a man of his discerning eye will observe many new and curious facts in this western hemisphere; and his reputation in Europe is capable of dissipating many prejudices respecting America which have been propagated in that quarter . . . by less discerning and less candid travelers."[23] But later, before his return to France to enter political life, the opinion was nearly unanimous that he was a man more to be admired at a distance than to be liked at close hand. An acquaintance recalls him as "a man of proud spirit and sour temper" and that in Philadelphia he "used to say, with his accustomed vanity, that such men as Talleyrand furnished the outlines of a work which authors, by profession like himself, put into suitable style."[24] In similar vein another refers to an encounter in Baltimore, concluding that "though gratified with the unexpected intercourse with so distinguished a man, I cannot say that Monsieur Volney pleased me much. He was cold and satirical."[25]

Volney was one of the few foreign visitors who came to the States at this period with the definite purpose in mind of publishing a description of this country, and almost the only one who, in final composition, avoided the diary style of writing. Thus, he is unfairly classed with the "travelers" because he was much more than this; nor is he grouped with entire propriety with the early geologists as Merrill has done[26]—it is demonstrable that he followed the geographical method in preliminary investigation and final writing. The latter is made obvious by his volume, the former is in part indicated by Mitchill who states that Volney was "chiefly employed in gathering information by conversations with intelligent men and by journies through the several states and territories, concerning the actual condition of the country."[27] As an interviewer he was handicapped by a personal vanity and aloofness which many disliked; others denounced him as an atheist. Above all, he had won a reputation for radical political beliefs, even though afterwards he became a member of the French conservative senate. He was often called, opprobriously, a "free thinker." As a result many doors were closed to him: it is recorded that Washington's letter of introduction to likely consultees was at best a grudging one. Apparently, however, he

[23] *South Carolina Weekly Museum*, Vol. 1 (1797): 643.

[24] Samuel Breck, "Recollections of my acquaintance and association with deceased members of the American Philosophical Society," 1862, MS American Philosophical Society.

[25] Thomas Twining, *Travels in America One Hundred Years Ago: Notes and Reminiscences of Thomas Twining*, N. Y., 1893, p. 122.

[26] George P. Merrill, *The First Hundred Years of American Geology*, Yale Univ. Press, New Haven, 1924.

[27] [Samuel L. Mitchill], Review of the *Tableau* in *The Medical Repository*, Vol. 2, Second Hexade (1805): 173.

was endowed with some modesty for he wrote to a friend that "il me semble impossible d'avoir une idée nette de ce grand pays à mois trois ans, surtout pour un français."[28] A. Von Humboldt is one of the many to assure us that Volney was an able observer.[29]

It was Volney's belief that, at the conclusion of his study, he was in a position to "distribute with sufficient certainty" the major regions and provinces of the inhabited area. This he abruptly does in the opening pages: that is to say his major conclusions, somewhat in the tradition of geography, are stated at the outset with few preliminaries and a minimum of supporting data. His regions are of various sorts, some based on physiography (regions of internal structure) and others on climate and vegetation. Finally he groups all regions into three great provinces (countries) of which his Atlantic Country appears broadly analogous with the contemporary concept of the seaboard. This "Atlantic Country," he observes, is notable for its diversity of surface, climate and vegetation; nevertheless it is broadly unified by association with the ocean and by a more mature stage of development than contiguous areas inland. To use his own words, it represents the "seat of the nation and the residence of the largest portion of the population." The inland limits thus set up or hinted at relate to major changes in the natural environment and in part to cultural differences, occasionally to both.

The limits of all these smaller and larger units are not shown precisely on a map, although hand colored maps in rare volumes[30] outline the extent of some regions, and boundary lines are elsewhere partially drawn. From the context, cartographic expression can be given with some confidence to those regions not fully outlined, especially by extending the seaboard limits into Lower Canada and Spanish East Florida. Much depends, therefore, on the degree of reliance which may be placed upon Volney's competence as an observer. Following are some of the many avenues taken in appraising his credibility.

First of all, of course, is his three years of observation in this country and an earlier experience in similar work elsewhere. Twining, who acted as Volney's assistant for a time, wrote that "he examined things as we went about very minutely." Second, the limits given natural regions agree, even in certain details, with modern concepts. Thus, his treatment of climate, which occupies the greater part of the book, furnishes an indirect means

[28] Quoted by Frank Monaghan in: "French travelers in the United States, 1765 to 1931," *Bull. of the New York Public Library*, Vol. 36 (1932): 166.

[29] In: "Some particulars relating to a terrible hurricane," *The Medical Repository*, Vol. 2, Second Hexade (1805): 354.

[30] The copy possessed by the New York Public Library contains a regional map in color.

of testing his scholarship and skill in observing and interpreting geographical phenomena. An investigation has shown that Volney placed much dependence upon climatic and phenological records in his endeavor to "put into suitable form" this aspect of the geography of eastern North America. Specific reference is occasionally made in the *Tableau* to climatic summaries; at other points one may only infer other sources upon which he based conclusions. Special pains were consequently taken, in this appraisal of Volney's integrity, to investigate the sources which he actually and presumably used. This special inquiry revealed an altogether surprising coverage of weather records many of which compare favorably in accuracy with the official data since amassed at or near the same places.[31] The different climatic records available to Volney and his contemporaries were not always directly comparable: some observers measured only rainfall, others only temperature. The latter element was especially favored because the observed temperature contrasts of the Atlantic seaboard and Europe's west coast inspired those interested in climatic phenomena to discover the facts. Favorite hours for recording temperatures were sunrise, two P. M., and sunset. Dr. E. A. Holyoke of Salem managed somehow in the midst of a busy medical practice to "read the thermometer" nine times a day for a quarter-century and, less frequently, for another fifty years. The localities where some of the more reliable and significant data were recorded and the names of the observers are shown in Fig. 1.[32]

Not content with meteorological records, Volney consulted with many presumed authorities: this we learn from statements made by Von Humboldt and letters from Jefferson to Volney.[33] Evidence that some of Vol-

[31] This conclusion was reached independently of similar conclusions by Willis I. Milham writing in *Monthly Weather Rev.*, Vol. 52 (1924): 503–570 and by J. B. Kincer in *Ibid.*, Vol. 61 (1933): 251–259 and *Nebr. Crop Growers Ass'n Bull.* 1937.

[32] This material was brought down, for the purposes of the entire study, to 1810; thus some of it was not available to Volney. To avoid misunderstanding, it is necessary to state that the list of summaries does not pretend to completeness, but is rather a list selected for reliability and areal coverage. Not included are a few known summaries for places beyond the seaboard (Natchez, Miss., 1799–1803, Cincinnati, 1806–1813) and many within the seaboard (for example, the Charles Peirce data for Philadelphia starting with 1790 and for Andover, Mass., 1798–1808). The Holyoke summary for Salem appears to be the longest, most elaborate record made by one individual in this country, exceeding in completeness if not also in length the three "longest" records suggested by previous writers—the H. D. Garvey record for North Lewisburg, Ohio, the Jesse C. Green record for West Chester, Pa., and the Peirce record referred to above. The selected climatic records were found in various sources and places, especially in the early *Memoirs* of the American Academy of Arts and Sciences, the *Transactions* of the Royal Irish Academy, in popular magazines, notably the *Columbian*, and in manuscript in the Harvard College Library, the American Philosophical Society and private collections.

[33] Letter, Jefferson to Volney, January 8, 1797, in *Volney et l'Amérique*, Gilbert Chinard, The Johns Hopkins Univ. Press, 1923, pp. 59–62.

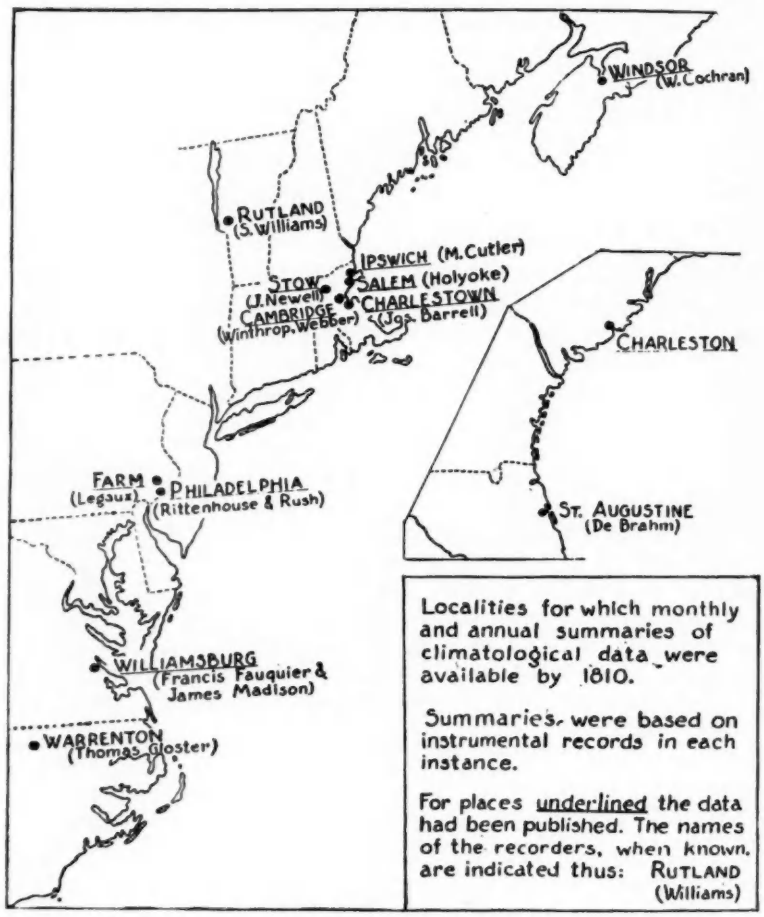

FIG. 1.—Stations of Early Instrumental Weather Records.

ney's generalizations from this varied source material were not very far from absolute truth is found in his classification of climatic areas. For example, his dividing line between two major coastal climates has essentially the position of Thornthwaite's BB'–BC' boundary.[34] According to him "the parallel of the Potomac . . . forms a distinguishing line. The

[34] C. W. Thornthwaite, "The climates of North America according to a new classification," *Geogr. Rev.*, Vol. 21 (1931): 633–655, and map.

EDWARD AUGUSTUS HOLYOKE

dominion of snow is bounded here. . . ." This conclusion seems to have been based in part upon data of snowfall and in part upon the observed contrast in the numbers of sleighs north and south of this "line."

Volney states that "after laying a suitable foundation in an examination of climate and soils [land surface]," he proposed "to consider the numbers of the people, their diffusion over the surface of their territory, their distribution into classes" and many other matters. But on his return to France, preoccupation with political affairs, he writes, "will not permit me to complete the whole." Instead he offers that part which may be detached "without injury or mutilation, from the whole performance." In these words he explains the fragmentary nature of his *Tableau* which forms a partial foundation to a regional study but one upon which the author erected no superstructure. Even this fragment, he hopes, will "cast some new light upon many subjects that have been hitherto wholly overlooked."

JOHN DRAYTON

John Drayton wrote in a decorous preface to his manuscript of the *View of South Carolina* twenty years after its publication that "The work was composed written & printed during the years 1800, 1801 and 1802 by myself while I held the reins of Government of South Carolina, . . . with the view of communicating for public use the knowledge I had obtained from the enquiry of some years—laborious searches into books—and sources of information presented to me, during the performance of my Executive duties. I had no intention of producing a book on geography or of entering into special statistical accounts other than what it suited me to give—; but I merely proposed to write about such things as I believed myself justified in doing: not only from my own personal knowledge but from good Authority; and that in the mode and manner most convenient to

myself." Curiously, he does not mention that his preparation included many years of deliberate and casual observation, enough to earn him the nickname of "traveling Jack."

A distinctive feature of this work is the care with which the author relates his observations on natural and cultural features to geographic regions which latter are outlined on the large-scale map accompanying the book. This map (Fig. 2) appears to have been the first one produced in

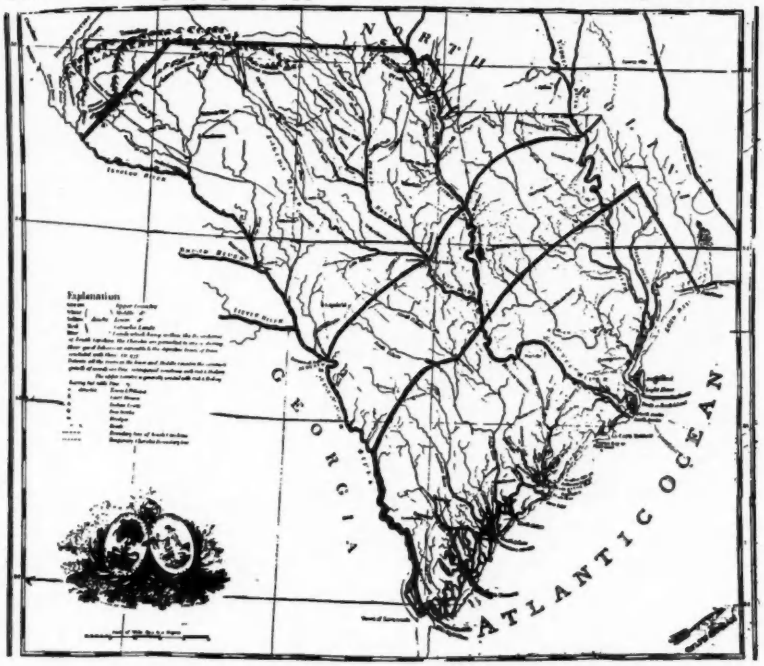

FIG. 2.—Drayton's Regional Subdivision of South Carolina.

this country on which regions are precisely defined. Presumably, therefore, we may designate Drayton as our first regional geographer even though he disclaimed any intention of writing in this field. The maritime region reaching to the Fall Line which, cartographically, was extended southward by the younger Michaux in 1802,[35] is taken to be the inland limit of the seaboard. A conviction that the opening chapters of this work represent the careful and mature thought of an intelligent observer is confirmed by con-

[35] François André Michaux, *Travels to the West of the Alleghany Mountains* [etc.] (map in some copies), London, 1805.

SAMUEL LATHAM MITCHILL

temporary reviews which, except in one instance,[36] were favorable. The review written by Samuel L. Mitchill, one of the "geographical" natural scientists of the time, implies that the regions outlined were in more or less common acceptance and that Drayton was not particularly original in putting them on a map.[37]

The other works in Group A were subjected to a similar scrutiny and validation but economy of space forbids an equally full treatment of them.[38]

[36] *Monthly Anthology and Boston Review,* Vol. 3 (1806): 205–210. The author of this review is unknown and probably had no real knowledge of the subject matter. This reviewer was most concerned with the "inelegant title" of the book.

[37] *The Medical Repository,* Vol. 3, Second Hexade (1806): 399–402.

[38] Bouchette's *Topographical Description of Lower Canada* in some respects outranks the others. It is recognizable as the work of a competent scientist, one who was for a time surveyor-general of Lower Canada. Only one unfavorable comment was discovered, in *Sketches of Lower Canada,* App. II, by Joseph Sansom,

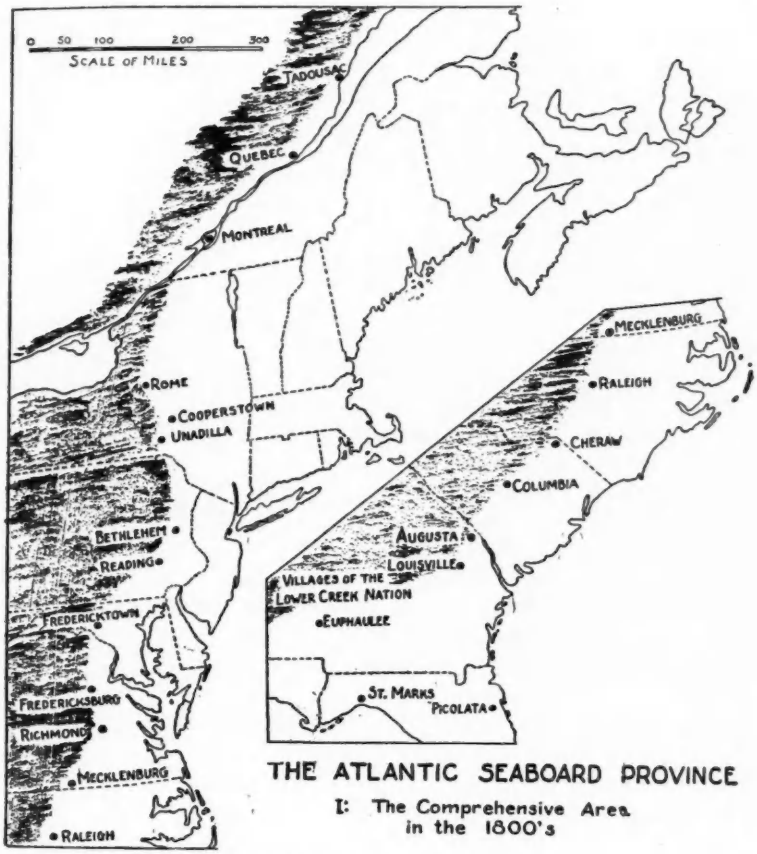

FIG. 3.—The Atlantic Seaboard, Map I

and even here the critic acknowledges that as a topographical survey it is "not without the merits of accuracy and minuteness." The title of Williams' book, *The Natural and Civil History of Vermont*, scarcely does justice to its areal coverage. Considerably less significant are Dr. Barton's *Fragments* and Dr. Mitchill's *Sketch*. Both men exerted more influence in geographical work as critics and teachers than as authors. Barton, of the University of Pennsylvania, for a time edited the *Journal of the Philadelphia Medical Society* and Mitchill edited the *Medical Repository*. The pages of both journals were utilized for many other purposes than the spreading of medical knowledge. For a sketch of Barton one may consult *The Port Folio*, 4th. Ser., Vol. 1 (1816): 273–287. Mitchill's most recent biography is: *A Scientist in the Early Republic: Samuel Latham Mitchill, 1764–1831*, by Courtney R. Hall who pictures his subject as intellectually superior, in many respects, to Benjamin Franklin.

The outline of the comprehensive seaboard province in Figure 3 seems to be a faithful rendering of the collective judgment of this group together with much supplementary data properly grouped with the sporadic observations. "Comprehensive" is meant to suggest that within the limits shown there are many areas with whose geography a reconstruction at the opening of the nineteenth century has no concern.

GROUP B: THE COMPENDIOUS TREATMENTS

The compendiums of this period are chiefly significant in that they show by their very bulk and numbers the existence of material suitable for compilation under the heading of geography. They are, without exception, sources of minor significance: most of the pertinent material they contain is better derived from the originals. For example, the statistics which form so much of their bulk—data of population, commerce and manufactures—are used unskilfully and are often rendered inaccurately. The occasional maps they contain are execrable. The better parts of the volumes are directly traceable, in most instances, to the works of Group A. In his compilation, the author was prone to borrow without credit from other works and slightly to re-word the observations thus secured, with the result that unless one is familiar with related literature, he must agree with Dryer that the gazetteers of this period "are a wonder and a puzzle to the present day student."[39] The compilers, not recognizing regions, used states or other large political subdivisions as units of organization. To extract that part of the material which positively relates to the seaboard area is almost impossible.

The most scholarly compendium is the ponderous work of Ebeling. Each volume is a veritable state encyclopedia issued successively over a quarter-century, and much of the bulk is pure history. Not a single map is included in the copies inspected, but Lawrence Martin of the Library of Congress advances the information that D. F. Sotzmann compiled an accompanying map series bound in a folio atlas entitled "Erste bis dritte (letzte) Sammlung von Landkarten für Schulen" (1796). Ebeling admitted that his was "a bold undertaking for a foreigner, but a necessary one considering the great desire of my countrymen for being acquainted with your happy Country."[40]

[39] Charles R. Dryer, "A century of geographic education in the United States," *Annals of the Assoc. of Amer. Geogs.*, Vol. 14 (1924) : 117.

[40] "Letter to Noah Webster, May 1, 1795," MS. Harvard College Library. This letter was written on the occasion of Ebeling sending the second volume "of my description of America" to Mr. Webster whom he regarded as an able critic. The enormous mass of material, said to have numbered several thousand items, from which Ebeling prepared his compilation was presented to the Harvard College Library by Israel Thorndike.

Little space need be given the Morse "geographies" which increased in bulk and diminished in quality over a number of years. In appreciation of the Reverend Morse it may be said, however, that he performed services seldom attributed to him. He generously supplied Ebeling with some of the material which comprised the latter's library. Having won a reputation as an authority on geographical matters, many people wrote to Morse propounding questions which he might be presumed to answer. Frequently Morse transmitted the questions to individuals better informed on the subject than he. The answer sometimes took the form of a published letter or essay, thereby adding to the descriptive resources of the period. Many citizens aroused by the errors in his books sought to offer corrections by means of published letters and pamphlets. We owe many a detailed description, as that of Williamsburg, Va., in 1795,[41] to attempts on the part of informed readers to set the record straight.

The compilations reached an all-time low with the appearance of a work by James Mease, but fortunately this production was not called a geography.[42] Its first hundred pages are pirated from Volney and most of the rest is pieced together from the works in Group A.

No modern geographer has condemned these works in more suitable terms than those employed by critical readers at the time. According to one, the compilations "are little more than medleys of politics, history and arts . . . arranged in the order in which the territories stand on the map."[43] Deploring the numbers of mediocre gazetteers another reviewer observed that "if the value of geography should be estimated by the cultivation it has received, it would take no very high rank among the sciences. . . . It has been deserted by the man of genius, philosophy and taste, as a pursuit where no laurels are to be gathered or such only as are short in their duration and fading in their verdure."[44] This reviewer and probably nearly everyone at the time failed to realize that worthwhile geographic work was being issued under other titles by people who did not style themselves as geographers.

SPORADIC OBSERVATIONS

The sporadic observations supply essential details omitted from or presented sketchily or unsatisfactorily in the regional works of organization.

[41] [St. George Tucker], "A letter to the Rev. Jedidiah Morse, A.M., author of the American Universal Geography," Richmond, Va., 1795.

[42] *A Geological Account of the United States* [etc.], Phila., 1807.

[43] In review of Scott's gazetteer, *American Review and Literary Journal*, Vol. 1 (1801) : 288.

[44] In review of Pinkerton's geography in *Monthly Anthology and Boston Review*, Vol. 2 (1805) : 251–257.

They run to such great length that unless the present day geographer subordinates them to their proper position *as* details, they are likely to hinder his "seeing the woods for the trees."

In the rough classification presented above (p. 208), these observations are ranked in descending order of significance in so far as a preliminary outline of the seaboard province in the 1800's is concerned. Those of the third group, contemporary writings in magazines and newspapers, are distinctly ampliative of the character of a region once its main features are roughed out. Productions in the second group (publications by learned societies), which are of a more formal nature and deal for the most part with commonplaces, fill many gaps deliberately or unwittingly left open by the organizers. Into this group fall any number of detailed descriptions or "circumstantial accounts" of cities, towns and agricultural areas.[45] Frequently such material is useful for reasons other than those which inspired the preparation of it. This is illustrated by the many seaport town descriptions growing out of the "yellow fever" epidemics which worked havoc from Charleston to New Haven during the 1790's. Interest in a branch of investigation then called "medical topography" brought forth a large number of descriptions photographic in their realism, in which special attention is paid to the extent of forest, swamp and improved land. In such a case one overlooks the obsolete medical theory which preludes the description.[46]

Travel records which have passed the test of authenticity[47] have been used mainly for the purpose of fixing or validating the limits of regional units at the particular place where the route of travel crossed the boundaries indicated by the authors of the larger works. In the extent between New England and the southern coastal plain the organizers are vague as to the limits of the older settled seaboard area. Particular attention, therefore,

[45] The early *Collections* of the Massachusetts Historical Society contain numerous descriptions, for example: "A description of Duke's County" (1807), "A topographical description of Truro" (1794), ". . . of Raynham" (1793), "of . . . Sandwich, Falmouth [etc.]" (1802).

[46] For example, "A report . . . on the medical topography of Savannah and vicinity," *The Medical Repository,* Vol. 4, Second Hexade (1807): 352–363.

[47] Some travel records of this period were found to be wholly or partly imaginary. Pure fabrications include, *An Excursion to North America,* by Priscilla Wakefield, London, 1810, and Bulow's travels as published in *The Port Folio* from May 8, 1802 to Jan. 29, 1803. A contemporary of Thomas Ashe who wrote *Travels in America* [etc.], termed this a "miserable compilation" from earlier sources. (*Monthly Anthology and Boston Review,* Vol. 6 (1809): 149.) Doubt arises that Viscount de Chateaubriand personally beheld in the 1790's some of the areas described in his *Travels in America and Italy,* Vol. 1, London, 1828. These are examples of literary efforts of people who have been aptly called "sedentary travelers."

was paid to the observations made on transects east and west across Pennsylvania and New York.

Transects of New York and Pennsylvania during this period include:

Timothy Bigelow: *Journal of a Tour to Niagara Falls in the Year 1805.* Boston, 1876.

John Taylor: "Journal of Rev. John Taylor's missionary tour through the Mohawk and Black River countries in 1802," in *Doc. Hist. of New York,* Vol. 3, 1850, pp. 671–696.

John Maud: *Visit to the Falls of Niagara in 1800.* London, 1826.

Washington Irving: *Journal, 1803,* Oxford Univ. Press, 1934.

Duke de la Rochefaucault Liancourt: *Travels through the United States of North America in the Years 1795, 1796 and 1797,* London, 1799.

Theophile Cazenove: *Cazenove Journal, 1799,* Haverford College Studies No. 13, 1922.

Antoine F. Saugrain: "Diary of a Journey from the Falls of the Ohio to Philadelphia . . . 1788." Trans. by C. F. Bliss, 1875. MS. Boston Public Library.

Thomas Chapman: "Journal of a journey through the United States, 1795–1796," *The Historical Magazine,* Vol. 15 (1869): 357–368.

François André Michaux: *Travels to the West of the Alleghany Mountains* [etc.], 1802, London, 1805.

Isaac Weld, Jr.: *Travels through the States of North America and the Provinces of Upper and Lower Canada . . . 1795, 1796, 1797,* London, 1799.

The transect records provided by these first-hand observers are acceptable for the restricted purpose at hand mainly for two reasons.

In the first place, their routes may be precisely outlined on a large-scale map. This is a preliminary step which the investigator must take since the majority of travelers, even the more reliable, provided no route map of their own making. Necessarily the geographer will refuse to accept observations which cannot be tied to a particular place.

In the second place, the observers in this list, in their comparatively slow passage through the central area, made detailed notes on material landscape features, including the number of farms per mile, the kinds of crops raised, the proportion of cleared to forest land, the presence or absence of stumps in cleared land, the character of the road, the size of villages and towns, and the relative stage of settlement. The notes independently made by Bigelow, Taylor and Maud in their journeys through the Mohawk Valley during a five year period are in essential agreement, so nearly alike, in fact, as almost to suggest that they traded ideas. That being improbable in this case, it is to be inferred that no reasonable doubt could exist as to the location of the transition zone between the older and newly settled land in this lowland. This was at Rome. All agreed that west of Rome lay a new, raw land, rapidly emerging from the wilderness but still sparsely peopled. Land

speculation was rife in the "Genesee Country" and in the "Military Tract." In the latter, twenty-five townships had been surveyed on the new rectangular plan and land was selling at from three to six dollars per acre. The journal of Washington Irving, then an impressionable youth, confirms the more prosaic notes of the other travelers—he was glad to return to civilization after a few weeks of roughing it in the wilds of western New York.[48]

This illustrates the principal use to which other travel records not listed here have been put. Travelers' observations, moreover, often furnish intimate sidelights on the geography of areas they saw. It seems probable that the observations of foreign travelers on the material objects of the landscape are more to be relied upon than their comments on social, political and religious matters with which their volumes are partly filled. Few of them had any prior acquaintance with the regions through which they were to pass and published their accounts from notes taken *en route* without later revision in the light of other literature descriptive of the same areas. This makes their accounts all the more valuable: they offer views independent of the more formal presentation. They often dwelt upon details omitted from the works of others—crop types, village architecture, street patterns of towns and cities, methods of conveyance and road conditions. Philadelphia was the favorite gathering place and point of departure for the foreign travelers.

A plotting of the routes of the travelers fails to confirm the conclusion of a writer who, in reference to the English travelers, states that they were likely to follow the same routes.[49] That they did not do so more often is perhaps to be regretted. The investigator wishes for more cases like the Mohawk Valley which was seen by many travelers at about the same time, thus giving some assurance that out of the varied commentary a reasonably truthful picture will emerge. One also wishes for more travelers as methodical as Liancourt who, if we take him at his word, rode with notebook open and pencil poised ready to jot down significant points at the moment of observation.

CARTOGRAPHIC RESOURCES

Many maps prepared by a group independent of the writers are contemporary with this period.

[48] In 1798 the city of Buffalo consisted of five dwellings, one tavern and one store, all constructed of logs. The mail to Buffalo, first received in 1803 by horseback, continued to be thus carried once every two weeks until 1806 when a weekly route was established. *Doc. Hist. of New York*, Vol. 3, p. 726.

[49] Jane L. Messick, *The English Travellers in America, 1785 to 1835*, Columbia Univ. Press, 1922.

Perhaps the distinguishing feature of the maps is the cartographic break with the past which they represent. The maps of larger significance were made by map-makers, not by map-copiers. Consequently there is a minimum of carry-over from post-Revolutionary maps to those prepared or published at the opening of the next century.

Map-making during this period is linked with certain individuals who compiled much new data, some of which they themselves secured. Associated with the coastal charts, especially of New England, is the name of Nathaniel Bowditch. Maps of larger coverage and more general character were prepared by A. Arrowsmith who issued frequent revisions as new data came to light. A new departure is represented by the large-scale post road map of Abraham Bradley available in some collections of rare maps. The cartographic record of Lower Canada at this time was in the competent

Joseph Bouchette

hands of Samuel Holland and Joseph Bouchette. The Holland map, for example, carries the boundaries of the seigniories as they were at the close of the eighteenth century.

Nevertheless, with all their variety the maps do not show some distributions now considered fundamental in a regional study. For example, there is no detailed population distribution map except a few fragmentary manuscript maps covering minute areas. It appears that those interested in population problems expended their energies in estimating the probable future population rather than in leaving an authentic record of the distribution as it was.[50]

Partially filling this gap are population density distribution maps prepared by modern scholars from official enumerations, of which the earliest for the United States was that of 1790, but these maps are of a generalized character.[51] Even if a detailed population map of the United States por-

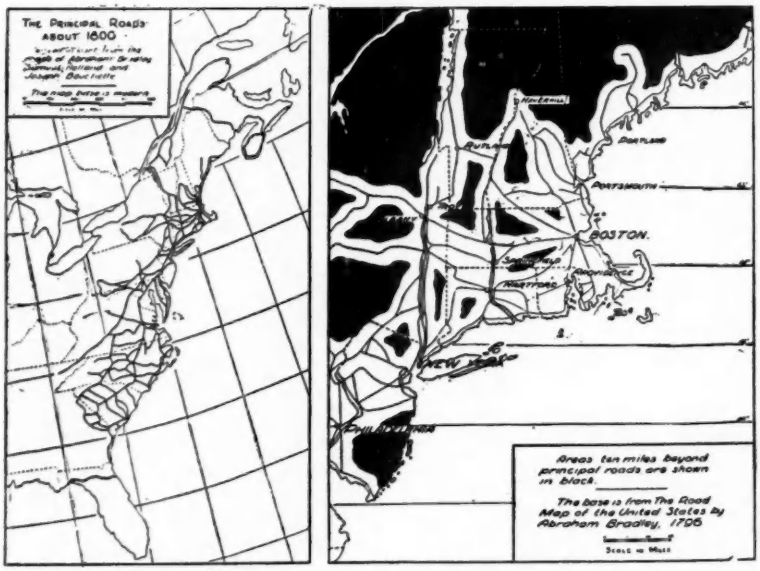
THE PRINCIPAL ROADS ABOUT 1800
BOSTON.
Areas ten miles beyond principal roads are shown in black.
The base is from The Road Map of the United States by Abraham Bradley, 1796

FIG. 4.—Roads.

[50] These speculations provided a favorite theme for discussion in popular magazines as: *The Weekly Magazine of Original Essays, The Monthly Magazine and American Review* and *The American Museum.*

[51] The best series is in the *Atlas of the Historical Geography of the United States,* Charles O. Paullin and John K. Wright, Carnegie Inst. of Wash. and Amer. Geogr. Soc. of N. Y. 1932.

tion of the seaboard area be within the limits of achievement, such does not appear to be the case for maritime Canada and Spanish East Florida. A Canadian writer has pointed out that although the first enumeration of modern times was the Census of New France in 1666, "Canada was slow to create a permanent organization to deal with the mass of facts collected. A permanent Census and Statistics Office was created only in 1905."[52] There are, of course, estimates of total population for the bordering areas. Arthur P. Whitaker has estimated the population of East Florida in 1800 to have been 4445, of whom 2300 were slaves. Burpee's *Atlas*[53] contains maps showing areas of early settlement but the period the maps are intended to represent is not made clear.

An acceptable substitute for a detailed population map for the whole area is developed by applying Professor Mark Jefferson's technique,[54] well known to geographers, to a number of maps showing roads as of the opening of the nineteenth century. Figure 4 shows a composite road map on a modern base and also a portion of the Bradley post road map treated in Jefferson's way. This technique has been applied to the entire Bradley map together with many additional data. Figure 5 shows the final result, with the delineation of the "effective area." This brings into relief, by exclusion of large "insular"—mainly mountainous and rugged—areas, those parts of the comprehensive seaboard province upon which a geographical study at the opening of the nineteenth century properly centers.

CONCLUSIONS

Geographical materials recorded during the closing years of the eighteenth century and the opening years of the next provide a foundation for a regional reconstruction of the Atlantic seaboard. They can be most effectively used by a present-day student trained in the handling of geographical materials and reasonably familiar with the objectives of modern geographical research. Before these materials could be utilized they had to be discovered. The process of discovery required special research methods predicated on two assumptions: that a multiplicity of contemporary evidence was necessary, and that a large share of the descriptive record of any period is not entitled geography. The discovery process required the spreading of a net fine enough in mesh to catch the greater part of the presumably significant material. "Significant" was in this case defined to mean all manner of geographical observations and incidental data which

[52] G. E. Jackson, "Statistics in Canada," *Canadian Hist. Rev.*, Vol. 2 (1921): 217.

[53] Lawrence J. Burpee, *An Historical Atlas of Canada*, Toronto, 1927.

[54] First published in "The civilizing rails," *Econ. Geogr.* Vol. 4 (1928): 277–231.

FIG. 5.—The Atlantic Seaboard, Map II.

bore upon the seaboard area at the time, not merely that part of the sum total which could be directly used in a presentation. Consequently, the assemblage included much material—climatic data and descriptions of soil types, for example—rendered obsolescent by the progress of systematic science. Such observations were found to have value as criteria by which the authenticity of the rest could be measured. Once assembled, the materials furnished their own guides as to utilization. Attempt has been made to show how a small part of this material has been used in a research problem designed to fall within the definition of historical geography. The results could not have been predicted before all the material was in hand.

Apparently, the best way for geographers to understand the seaboard area at the opening of the nineteenth century is by consulting those who attempted to describe it at the time. The record they made seems reasonably complete and intelligible.

The portraits appearing in this article are a few of a series of pen-and-ink sketches prepared by Eunice R. Brown from copies of engravings and lithoprints.

University of Minnesota,
March, 1938.